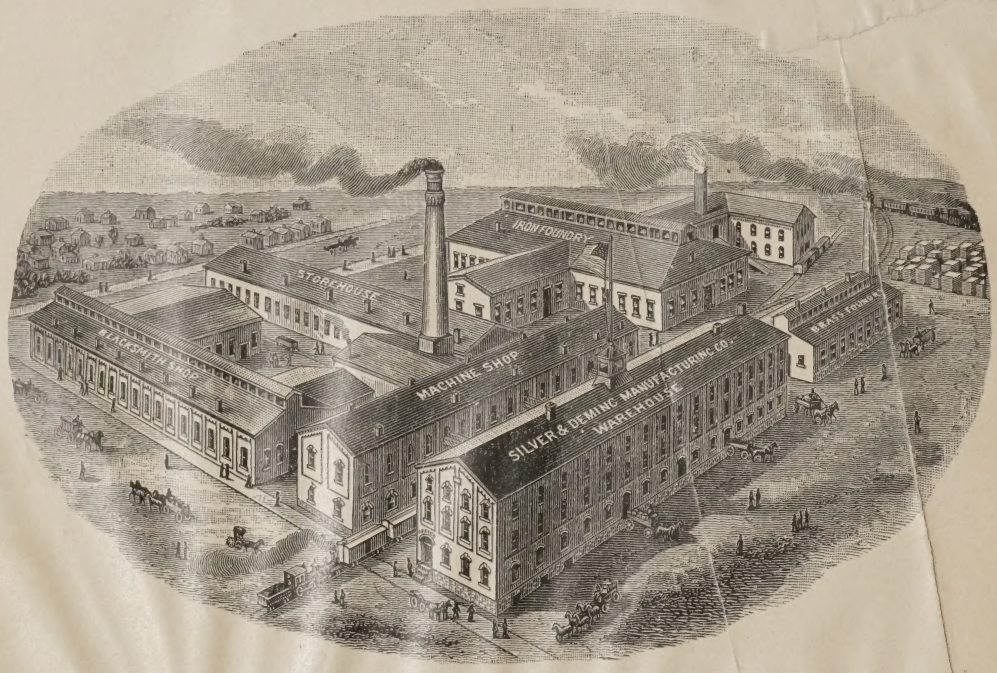
The Deming Co.

Salem, Ohio, U.S.A.



VIEW OF SILVER & DEMING MANUFACTURING COMPANY'S WORKS,

SALEM, OHIO, U. S. A.

ILLUSTRATED

Catalogue and Price List

OF

IRON AND BRASS PUMPS

HYDRAULIC ⁘ MACHINERY,

WAGON MAKERS' AND BLACKSMITHS' TOOLS,

BUTCHERS' TOOLS,

ENSILAGE AND FEED CUTTERS, ETC.

MANUFACTURED BY

SILVER & DEMING MFG. CO.

SALEM, OHIO, U. S. A.

1889.

a. c. Silver + Deming Mfg. Co.

GIES & CO., ENGRAVERS AND PRINTERS, BUFFALO, N. Y.

OFFICE OF

THE DEMING COMPANY,

Salem, Ohio, September 1st, 1891.

Since this Catalogue was issued an important change has taken place in the business of this company. Our facilities have been greatly increased and many improvements have been effected, both in the construction of our Pumps and in the machinery, tools, and appliances for making them. We invite attention to the new Pumps, etc., shown on supplementary pages 160 I to 160 X, and confidently believe we have in them the best articles of the kind yet produced.

The change in our business referred to, is best explained by the following copy of a circular letter issued August 15th, 1890:

THE SILVER & DEMING MANUFACTURING COMPANY

will, from and after this date, be known as

"THE DEMING COMPANY."

It will retain the original charter, and occupy the same plant as heretofore.

The trade of this Company has increased to such an extent as to render expedient a division of the business.

A new company, separate and distinct from The Deming Company, and known as The Silver Manufacturing Company, has been organized, and adequate works have been erected in this city, where will be continued the exclusive manufacture and sale of the following lines of goods formerly made by The Silver & Deming Manufacturing Company, viz: Ensilage and Fodder Cutters, Blacksmiths' Drills, Carriage Makers' and Butchers' Tools, and Saw Gummers.

Orders for the goods above enumerated, should hereafter be addressed to The Silver Manufacturing Company, Salem, Ohio.

The facilities of The Deming Company have by this change been materially increased, and their entire attention will hereafter be devoted to the manufacture and sale of Pumps and auxiliary lines.

All orders for Pumps, Hydraulic Machinery, Well Supplies, Etc., and all correspondence relating to the settlement of accounts, or matters now pending with The Silver & Deming Manufacturing Company, should be addressed to The Deming Company.

THE DEMING COMPANY,

WM. L. DEMING, Secretary.

Salem, Ohio, August 15th, 1890.

A. R. SILVER, President.
JOHN DEMING, Vice-President.
W. F. DEMING, Sec. and Gen. Manager.
WILLIAM SILVER, Treasurer.
E. W. SILVER, Superintendent.

OFFICE OF SILVER & DEMING MFG. CO.

ESTABLISHED 1854.

SALEM, Ohio, January 1, 1889.

IN PRESENTING this Edition of our GENERAL CATALOGUE, we desire to call attention to the many valuable additions and improvements recently made to the various and extensive lines of goods manufactured by us.

WITH THE AID OF EXPERIENCED MECHANICS and the latest Improved Machinery, and by careful attention to every detail in the manufacture of our goods, we are enabled to produce them in the best possible manner.

IN THIS CATALOGUE we have included several new features of convenience for the use of customers in ordering goods. On the following pages will be found an adequate TELEGRAPHIC CIPHER CODE; also, RULES and TABLES relating to Hydraulics, which are particularly useful to the Pump Dealer.

EVERY COMPLETE ARTICLE MANUFACTURED by us is given a "Cipher" word or name appended to the PRICE LIST, which, in connection with the "CIPHER CODE," will enable customers to place TELEGRAPHIC ORDERS for immediate shipment, with the use of but few words; thus avoiding the expense of lengthy telegrams.

ON THE LAST PAGES of this book we have added a complete list of REPAIRS to all articles of our manufacture; also, an ALPHABETICAL CLASSIFIED INDEX, and an INDEX to the FIGURES used in designating our goods.

WE SHALL ALWAYS ENDEAVOR to maintain our ESTABLISHED REPUTATION for fair dealing, and we hope that by promptness in shipments and careful attention to the wants of our customers, to merit a continuance of the patronage so liberally bestowed upon us in the past.

Very respectfully,

SILVER & DEMING MANUFACTURING CO.

NEW YORK, N. Y. SAN FRANCISCO, CAL.
CHICAGO, ILL. FORT WORTH, TEX.
KANSAS CITY, MO. LONDON, ENGLAND.

} Agencies and Branch Warehouses.

TELEGRAPH CIPHER CODE.

For the accommodation of customers, who may wish to order by telegraph, we append the below Cipher Code, the utility of which it is unnecessary for us to enlarge upon; it will often save considerable expense in telegraphic correspondence.

Nearly every article of our manufacture, aside from being designated by a *Figure* and *Number*, is given a Cipher word or name, by which it may be ordered by telegraph. In connection with the Cipher Code, this will be found a great convenience.

DIRECTIONS FOR CIPHER CORRESPONDENCE.

In writing Cipher telegraphic messages, great care should be exercised. Each Cipher word should begin with a capital letter; all t's should be crossed, and all i's dotted, and the greatest precision in penmanship should be maintained throughout. Where a blank space (. . .) occurs in a sentence (of the Code), the word to supply the place of the blank space should follow the Cipher word expressing such sentence, and if more than one blank space (. . .) occurs, the supplying words should follow in their order after the Cipher word. The following is our

Cable Address:
"SILVER,"
Salem, Ohio.

CIPHER VOCABULARY.

CONCERNING GOODS IN STOCK.

Pabulum —Have you in stock?
Packet —How soon could you furnish?
Pacify —{ Have you in stock, and could you ship at once?
Paddling —How soon could you ship if ordered at once?

Paddle —We have in stock.
Padlock —We have in stock, and could ship at once.
Pagan —We have in stock and will ship at once.

Pageant —{ We can ship part of the goods ordered at once; balance . . . . .
Paging —{ We have none in stock, but could furnish. . . . . .
Painful —{ We have none in stock, but could furnish in a few days.
Painless —{ We have none of the goods you order in stock.
Painter —{ We have no . . . . in stock, but will ship other goods promptly.
Palace —Shall we ship what we have in stock?

CONCERNING ORDERS AND SHIPMENTS.

Palatial —Can you ship?
Palatine —When can you ship?
Palaver —Have you shipped?
Paleness —When will you ship?
Palisade —When will you ship our order of . . . . ?
Passion —{ Advise us by telegraph when you can ship our order.
Passover —Have you shipped our order of . . . . . ?
Passport —{ How soon can you complete our order of . . . . . ?

Pastorate —{ Enter our order for . . . specifications for which follow by mail.
Password —{ Do not ship our order of . . . until further advised by us.
Pastime —{ If you can ship at once advise us by telegraph.
Pastoral —{ If you cannot ship within the time mentioned, advise us by telegraph.
Pastry —{ Ship what you have in stock, and let balance follow soon as possible.

Pastured —Ship when you can fill the order complete.
Pathetic —Ship immediately by freight.
Pathos —Ship immediately by express.
Pathless —Ship soon as possible, the cheapest way.
Paternal —Ship by rail.
Pathway —Ship by river.
Patriot —Ship by steamer.
Patrol —Ship by sailing vessel.
Patronage —Ship by fast freight.
Patron —Ship by cheapest route.
Pauline —Ship by quickest route.
Pauper —Ship by rail to . . . . via cheapest route.
Pausing —Ship by rail to . . . . via quickest route.
Pavement — { Ship by rail to San Francisco via . . . route.
Pavilion — { Ship by rail to . . . . obtaining lowest through rate.
Pawned —Ship by steamer via Liverpool.
Pawning —Ship by . . . . via . . . . . .
Peacock —Ship by steamer to London direct.
Peaceful —Ship by steamer to London via Liverpool.
Peakish —Ship by steamer to . . . . . via . . . . .
Peasant — { Our order of . . . . . not yet received. Send tracer for shipment at once.
Pebble — { In shipping give preference over all others to order of . . . . . .
Pecan — { Have you shipped us any . . . . on our order of . . . . . ?
Peccary — { We are in much need of . . . on order of . . . . if not already shipped, when will you ship?
Pedal —What is the lowest rate of freight to . . . ?
Pediment — { Make lowest possible contract of freight to destination.
Peddler — { Insure goods on order of . . . at actual value.
Pedestal — { Insure goods on order of . . . at 10 per cent above value.
Peevish —We will ship.
Pegged —We will make a shipment.
Pegging —We will ship your order.
Peguan — { We will complete your order of . . . in about . . . . . .
Pelican —We could probably ship . . . . . .
Pelting —We cannot ship for a week or two.
Penalty —We have shipped your order of . . . . .
Penance — { Your telegram was received after goods had been shipped.
Penitent — { We have entered your order of . . . . and will ship soon as possible.
Penman —Please send explicit shipping instructions.
Penning —Rate of freight to . . . . . is . . . . .
Pension — { We cannot obtain through rate of freight to . . . . . .
Pentagon —To-day or to-morrow.
Penury —In a few days.
Pepsin —The middle of this week.
Perfume —The last of this week.
Perjure —In about a week.
Perplex —The first of next week.
Perspire —The middle of next week.
Persist —The last of next week.
Perturb —In about two weeks.
Perusal —In about three weeks.
Pervade —In about four weeks.
Petulant —Answer by telegraph at our expense.
Pewter —Your letter was received in time.
Phalanx —Your letter was not received in time.
Phantom —Your telegram was received in time.
Pharisee —Your telegram was not received in time.

CONCERNING CLASSES OF GOODS.

Pianist —Pitcher Spout Pumps.
Picking —Cistern Pumps.
Picnic —Set-length Lift Pumps.
Pifferer —Set-length Force Pumps.
Pigeon —Hand and House Force Pumps.
Pigment —Deep Well Pump Standards.
Pigmy —Wind Mill Pump Standards.
Pilgrim —Anti-freezing Three-way Wind Mill Pumps.
Pillage — { Polished Iron Cylinders, or Working Sections.
Pillow — { Brass-lined Iron Cylinders, or Working Sections.
Pimple —Cast Brass Cylinders, or Working Sections.
Pinching —Brass Tube Cylinders, or Working Sections.
Pinnacle —Rotary Force Pumps.
Piquant —Double-acting Horizontal Force Pumps.
Piracy —Hydraulic Rams.
Pirate —Repairs for Pumps.
Pitiless —Fitted with Brass Valve Seats.
Pittance —Fitted with Inside Attachments.
Placard —Fitted with Metallic Valves.
Placid —Fitted with Hose Attachments.
Plague —Fitted for Lead Pipe.
Planet —Fitted for Iron Pipe.
Planish —Fitted for Lead and Iron Pipe.
Plaster —Without Brass Soldering Tubes.
Plate —With Cock on Spout.
Plated —With Double Discharge Air Chamber.
Plating — { With . . . Feet of Hose and Discharge Nozzle.

Platen —Fitted for 1 inch Suction Pipe.
Platonic — " " 1¼ " " "
Platoon — " " 1½ " " "
Platter — " " 2 " " "
Plaudit — " " 2½ " " "
Plausible — " " 3 " " "

Plausive —Fitted for 1 inch Discharge Pipe.
Plastron — " " 1¼ " " "
Playful — " " 1½ " " "
Playing — " " 2 " " "
Pleading — " " 2½ " " "
Pleader — " " 3 " " "

CONCERNING QUOTATIONS AND TERMS.

Pledge —At what price can you furnish?
Pledging —{ How soon and at what price can you furnish?
Plenteous —Give us your lowest quotation on. . . . .
Plentiful —Is your offer of . . . . . still good?
Pleonasm —Will you hold the quotation open?
Pliable —How long will you hold the quotation open?
Pliant —{ Will you give us the option of accepting your offer on or before. . . . . ?

Plodder —{ We quote you, expecting immediate reply by telegraph . . . . . .
Plotting —{ We quote you, expecting immediate reply by mail.
Plover —In answer to your telegram, we quote.
Plowing —We quote on your specifications . . . . .
Plowboy —{ We quote you for immediate acceptance, as follows:
Plowman — 5 per cent discount from list.
Plucked — 7½ " " " " "
Plucky — 10 " " " " "
Plucking — 12½ " " " " "
Plumage — 15 " " " " "
Plumed — 20 " " " " "
Plunging — 25 " " " " "
Plural — 20 and 10 " " " " "
Pluralize — 30 " " " " "
Plurality — 25 and 10 " " " " "
Polishing — 33⅓ " " " " "
Polar — 35 " " " " "
Polite — 35 and 5 " " " " "
Politics — 40 " " " " "
Political — 40 and 5 " " " " "
Pollard — 45 " " " " "
Pollen — 40 and 10 " " " " "
Pollution — 50 " " " " "
Polyglot — 50 and 5 " " " " "
Pompous — 55 " " " " "
Pomposity — 55 and 5 " " " " "
Ponderous — 55 and 10 " " " " "
Poniard — 60 " " " " "
Pontiff — 60 and 5 " " " " "
Pontoon — 62½ " " " " "

Popcorn — 60 and 7½ per cent discount from list.
Popular — 60 and 10 " " " " "
Populate — 65 " " " " "
Porcupine —60, 10 and 5 " " " " "
Porosity — 66⅔ " " " " "
Porpoise — 65 and 5 " " " " "
Portico —60, 10 and 10 " " " " "
Portrait — 67½ " " " " "
Possessor — 65 and 7½ " " " " "
Posterior — 65 and 10 " " " " "
Potash — 70 " " " " "
Pounding — 70 and 5 " " " " "
Poverty — 70 and 7½ " " " " "
Powder — 70 and 10 " " " " "
Powerful — 70 and 12½ " " " " "
Powerless — 70 and 15 " " " " "
Practice — 75 " " " " "
Prattle — 75 and 5 " " " " "
Prayer — 75 and 10 " " " " "
Praying —We accept your order at prices named.
Preached —{ We cannot accept your order at prices named.
Preacher —This quotation is for immediate acceptance.
Preaching —We cannot hold this quotation open.
Predicate —{ All open quotations on Pumps are withdrawn.
Predict —{ We cannot sell the goods at that price now; our quotation was for immediate acceptance.
Predicted —Terms: Cash with the order.
Preface —Terms: Cash on receipt of invoice.
Prefatory —Terms: Cash on receipt of goods.
Prefix —Terms: Sight draft with bill lading.
Prefixed —Terms: 30 days, net.
Prejudice —Terms: 60 days, net.
Prelate —{ Terms: 30 days, less one per cent discount for cash in 10 days.
Premium —{ Terms: 60 days, less two per cent discount for cash in 10 days.
Preside —F. O. B. Cars.
Pretend —Freight allowance. . . . cents per 100 lbs.
Printer —{ Advise us by telegraph, at our expense, standing and credit of . . . . . .

Information Concerning Pumps.

For the benefit of those interested we offer below a few suggestions and **Rules**, applicable to **Pumps**, concerning Capacity, Speed and Power required in operating, etc., etc.

Theoretically, water can be **raised vertically** by **suction**, about 33 feet; but since it is impossible to obtain a **perfect vacuum**, 25 to 28 feet is about as great a vertical distance as we would recommend a Pump (the Cylinder or Working Barrel), to be placed above the water, to insure its successful operation.

The **Necessary Parts** of a **Pump** are: the **Cylinder**, the **Plunger** (and its valve), the **Check Valve** (lower valve of Cylinder), the **Suction Pipe**, and the **Piston** or **Connecting Rod**. In order that the Pump work properly, all these parts should be in perfect condition; the Cylinder should be true, the Plunger should fit the Cylinder accurately, and both the Plunger Valve and Check Valve (lower valve of Cylinder) should seat **square** and **tight**. Every part of the Cylinder should be **air-tight**, particularly **all parts below** the Plunger.

For **ready reference** we give, on page 11, a **Table of Diameters** of **Pump Cylinders**, showing **capacity** per stroke **in gallons**, with **different lengths** of **stroke**; also, a Table giving the Diameters (identical with diameter of Cylinder), and Areas of Circles up to 24 inches. Also on page 10 some very **useful formulas** for obtaining Capacity, Required Power, and Speed of Pumps, etc. On pages 12 and 13 are arranged complete tables showing the Power required in pumping to various elevations, and amount of water discharged per minute.

CAPACITY.—To compute the capacity of any Single-acting Pump apply the following

Rule:—Square the diameter (in inches) of the Cylinder, multiply this by .7854, and the result (which is the area of the circle of Cylinder) by the length of stroke in inches. This gives the capacity in **cubic inches** per stroke (or revolution). Multiply this by the number of strokes per minute, and divide the product by 231 (the number of cubic inches in a gallon of water), and the result will be the **capacity** or amount of water the Pump will discharge per minute. **A Double-acting Pump** does duty at the forward and backward motion of the Piston-rod, and has **double the capacity** of a **Single-acting Pump**.

POWER.—To compute the **Power required** to **raise** a given amount of **water** per minute, to a **certain height**, apply the following

Rule:—Multiply the number of gallons the Pump discharges per minute, by 8.355 (the weight in pounds of one gallon of water), and the product by the total number of feet the water is to be elevated above the supply. The **result** is the **power required**, in **foot-pounds**; divide this by 33,000 (the number of **foot-pounds** of one horse-power) and you have the Horse-power necessary to do the work. About 20 per cent must be added to this to compensate for friction, slip of valves, etc. The power of five men, is equivalent to one horse-power. Steam Engines, with the usual rated horse-power, will do more than that number of horses.

SPEED.—To compute the the **number of strokes per minute**, necessary to discharge a given quantity of water (the diameter of Cylinder, and length of stroke being known), apply the following

Rule:—Divide the amount of water to be discharged (in gallons) **per minute**, by the **capacity** (in gallons) **per stroke** (see table on page 11 or rule for capacity above), and you have the **number of strokes per minute**, necessary to do the work. It may be well to note that the piston of a Power Pump should travel at a speed not greater than 100 feet per minute. Remember that a Double-acting Pump would run at half the speed of a Single-acting Pump to do the same amount of work.

SPEED OF PULLEYS.—In calculating either the **speed** or **capacity** of a Power Pump operated by Pulleys, the **diameter and speed** of either the Driving or the Driven Pulley must be known; and either the **diameter** or the **speed** of the **other** Pulley must be known, when the **required diameter**, or the **required speed** (as the case may be), can readily be determined by the following **Rules**:

FIRST.—The **diameter** and **speed** (revolutions per minute) of the Driven Pulley, also the **speed** of the Driving Pulley being known, **required** the **diameter** of the Driving Pulley:—Multiply the revolutions of the Driven Pulley by its diameter and divide the product by the revolutions of the Driving Pulley, and the quotient is the **required diameter of the Driving Pulley.**

SECOND.—The **diameter** and **speed** of the Driving Pulley, also the **speed** of the Driven Pulley being known, **required** the **diameter** of the Driven Pulley:—Multiply the revolutions of the Driving Pulley by its diameter, and divide the product by the revolutions of the Driven Pulley, and the quotient is the **required diameter of the Driven Pulley.**

IN ANY CASE, the **diameter** of the Driving Pulley **multiplied** by its **revolutions** equals the **diameter** of the Driven Pulley **multiplied** by its **revolutions**; and thus any three of the quantities being known the other may readily be determined. In other words; using *Proportion* or the "**RULE OF THREE**:" The **speed** of the **Driving** Pulley is to the **diameter** of the **Driven** Pulley, as the **speed** of the **Driven** Pulley is to the **diameter** of the **Driving** Pulley.

THE POWER TRANSMITTED from one Pulley to another is in **inverse** ratio to the change of **SPEED**, *i.e.*, if the **SPEED** is **decreased** the **POWER** is **increased** in the **same ratio**, and *vice versa*. The same rule applies to **GEARING**. This is theoretical, since **friction** causes a loss in the power transmitted.

Figures and Formulas.

The **areas of circles** are to each other **as the squares** of their respective **diameters.** In other words, doubling the Diameter of a Pipe or Cylinder increases its capacity (area of circle) four times.

Every foot of height in a column of water represents .434 pounds pressure to the square inch; in common practice however, it is estimated that every foot in height represents one half pound pressure to the square inch.

A cubic inch of water weighs .03617 lbs.
A cubic foot of water weighs 62.46 lbs.
A gallon of water weighs 8.355 lbs.
A gallon of water contains 231 cubic inches.
A cubic foot of water contains 1728 cubic inches.
A cubic foot of water contains 7.4805 gallons.

VALUABLE FORMULAS.—From the foregoing **rules** and **equivalents**, may be deduced the following *Concise Formulas* for computing the Capacity, Required Power, and Speed of Pumps.

Let

D = Diameter of Pump Cylinder in inches.
S = Length of stroke in inches.
N = Number of strokes per minute.
Q = Quantity of water raised per minute in gallons.
H = Height in feet, water is elevated from surface; or height of a column of water.

Then

$D^2 \times .7854$ = The area of a circle (of Cylinder) of a given diameter.

$D^2 S \times .7854$ = Capacity of Pump per stroke in cubic inches.

$\frac{D^2 S \times .7854}{231}$ = Capacity of Pump per stroke in gallons.

$\frac{D^2 S \times .7854}{1728}$ = Capacity of Pump per stroke in cubic feet.

$\frac{D^2 S \times .7854 \times 8.355}{231}$ = Capacity of Pump per stroke in pounds of water.

$D^2 S \times .7854\ N$ = Capacity of Pump per minute in cubic inches.

$\frac{D^2 S \times .7854\ N}{231}$ = Capacity of Pump per minute in gallons (=Q).

$\frac{D^2 S \times .7854\ N}{1728}$ = Capacity of Pump per minute in cubic feet.

$\frac{Q.\ H \times 8.355}{33{,}000}$ = Horse Power required to elevate a given quantity of water per minute to a certain height.

$H \times .434$ = Pounds pressure (per square inch) of a column of water.

$D^2 \times .7854 \times (H \times .434)$ = { Pounds pressure at a point in a Pipe or Cylinder, "H" being the vertical distance (in feet) to surface of water from said point, and D the Diameter of Cylinder or Pipe (in inches) at said point.

$\left(\frac{Q}{\frac{D^2 S \times .7854}{231}}\right) = \frac{Q}{D^2 S \times .0034}$ = { Number of strokes per minute necessary to raise a given quantity of water in gallons.

Table showing Water and Coal Required for Steam Power.

Horse Power.	Water per hour. Gallons.	*Coal per hour. Pounds.	Horse Power.	Water per hour. Gallons.	*Coal per hour. Pounds.
5	20	20	60	220	240
10	41	40	70	260	280
15	58	60	80	290	320
20	72	80	100	405	400
25	90	100	125	450	500
30	110	120	150	590	600
40	145	160	200	725	800
50	180	200	250	900	1000

*Combustion of Coal in Boiler Furnaces.

Kind of Boiler.	Pound per Hour (per sq. foot of grate.)
Cornish Boilers, lowest rate	4
Cornish Boilers, usual rate	10
Factory Boilers, usual rate	10 to 18
Marine Boilers, usual rate	14 to 26
Locomotive Boilers (with Blast Pipe), usual rate	60 to 130

*Note that it takes 2½ pounds of wood to equal the heating capacity of one pound of good coal.

TABLE SHOWING AMOUNT OF WATER
Discharged per Stroke by a Single-Acting Pump,

THE DIAMETER OF CYLINDER AND LENGTH OF STROKE BEING KNOWN.

THERE IS ALSO APPENDED A

Table of Diameters and Areas of Circles;

THE DIAMETERS OF CIRCLES AND CYLINDERS BEING IDENTICAL.

Diameter of Pump Cylinder in inches.	LENGTH OF STROKE IN INCHES, WITH CAPACITY PER STROKE IN GALLONS.											DIAMETERS AND AREAS OF CIRCLES.	
	1	2	3	4	5	6	7	8	10	12	INCHES.	Diameter of Circle (Pump Cylinder) inches.	Area of Circle (Pump Cylinder) square inches.
1	.0034	.0068	.0102	.0136	.0170	.0204	.0238	.0272	.0340	.0408	Gallons.	1	.7854
1¼	.0053	.0106	.0159	.0212	.0266	.0319	.0372	.0425	.0531	.0637	"	1¼	1.2271
1½	.0076	.0153	.0229	.0306	.0382	.0459	.0535	.0612	.0765	.0918	"	1½	1.7671
1¾	.0104	.0208	.0312	.0416	.0521	.0625	.0729	.0833	.1041	.1249	"	1¾	2.4043
2	.0136	.0272	.0408	.0544	.0680	.0816	.0952	.1088	.1360	.1632	"	2	3.1416
2¼	.0172	.0344	.0516	.0688	.0860	.1033	.1205	.1377	.1721	.2071	"	2¼	3.9760
2½	.0212	.0425	.0637	.0850	.1062	.1275	.1487	.1700	.2125	.2550	"	2½	4.9087
2¾	.0257	.0514	.0771	.1028	.1285	.1543	.1800	.2057	.2571	.3085	"	2¾	5.9395
3	.0306	.0612	.0918	.1224	.1530	.1836	.2142	.2448	.3060	.3672	"	3	7.0686
3¼	.0359	.0719	.1078	.1438	.1795	.2156	.2515	.2875	.3594	.4313	"	3¼	8.2957
3½	.0416	.0833	.1249	.1666	.2082	.2499	.2915	.3332	.4165	.4998	"	3½	9.6211
3¾	.0479	.0957	.1435	.1914	.2393	.2871	.3350	.3828	.4785	.5743	"	3¾	11.044
4	.0544	.1088	.1632	.2176	.2720	.3264	.3808	.4352	.5440	.6528	"	4	12.566
4½	.0688	.1377	.2065	.2754	.3442	.4131	.4819	.5508	.6885	.8262	"	4½	15.904
5	.0850	.1700	.2550	.3400	.4250	.5100	.5950	.6800	.8500	1.0200	"	5	19.635
5½	.1028	.2057	.3085	.4114	.5142	.6171	.7199	.8228	1.0285	1.2342	"	5½	23.758
6	.1224	.2448	.3672	.4896	.6120	.7344	.8568	.9792	1.2240	1.4688	"	6	28.274
7	.1666	.3332	.4998	.6664	.8330	.9996	1.1662	1.3328	1.6660	1.9992	"	7	38.484
8	.2176	.4352	.6528	.8704	1.0880	1.3056	1.5232	1.7408	2.1760	2.6112	"	8	50.265
9	.2754	.5508	.8262	1.1016	1.3770	1.6524	1.9278	2.2032	2.7540	3.3048	"	9	63.617
10	.3400	.6800	1.0200	1.3600	1.7000	2.0400	2.3800	2.7200	3.4000	4.0800	"	10	78.540
12	.4896	.9792	1.4688	1.9584	2.4480	2.9376	3.4272	3.9168	4.8960	5.8752	"	12	113.098
15	.7650	1.5300	2.2950	3.0600	3.8250	4.5960	5.3550	6.1200	7.6500	9.1800	"	15	176.715
18	1.1016	2.2032	3.3048	4.4064	5.5080	6.6096	7.7112	8.8128	11.0160	13.2192	"	18	254.470
20	1.3600	2.7200	4.0800	5.4400	6.8000	8.1600	9.5200	10.8800	13.6000	16.3200	"	20	314.160
24	1.9584	3.9168	5.8752	7.8336	9.7920	11.7504	13.7088	15.6672	19.5840	23.5008	"	24	452.391

The capacities in gallons given in the foregoing table, are for a **Single-acting Pump,** making one complete stroke (or revolution). The capacity of a Double-acting Pump is double that of a Single-acting Pump, with the same diameter of Cylinder and length of stroke.

TO OBTAIN THE CAPACITY of a Pump with diameter of Cylinder given in the table, but with a longer stroke than 12 inches (the longest stroke given in table), add or multiply the capacity to represent the required length of stroke.

For instance: The capacity of a Cylinder with an 18 inch stroke would be the same as that (having the same diameter) of a 12 inch stroke Cylinder, added to the capacity of a 6 inch stroke Cylinder; or the same result may be obtained by multiplying the capacity of a Cylinder with 6 inch stroke by 3. **To obtain the amount of water discharged** per minute, multiply the capacity per stroke by the number of strokes per minute. Rules and Formulas for computing problems in Hydraulics will be found on pages 9 and 10.

TABLE SHOWING AMOUNT OF WATER

Discharged per Minute at Different Elevations,

AND POWER REQUIRED TO OPERATE THE PUMP.

(1-8 to 8 Horse Power.)

Power required for pumping, and gallons of water raised per minute.

Elevation in feet.	⅛ H. P.	¼ H. P.	½ H. P.	¾ H. P.	1 H. P.	2 H. P.	3 H. P.	4 H. P.	5 H. P.	6 H. P.	7 H. P.	8 H. P.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
1	312.50	625	1250	1875	2500	5000	7500	10000	12500	15000	17500	20000
2	156.25	312.50	625	987.5	1250	2500	3750	5000	6250	7500	8750	10000
3	104.16	208.33	416.66	625	833.33	1666.66	2500	3333.33	4166.66	5000	5833.33	6666.66
4	78.125	156.25	312.5	468.75	625	1250	1875	2500	3125	3750	4375	5000
5	62.5	125	250	375	500	1000	1500	2000	2500	3000	3500	4000
6	52.166	104.166	208.33	312.5	416.66	833.33	1250	1666.66	2083.33	2500	2916.66	3333.33
7	44.66	89.28	178.50	267.8	357.1	714.2	1071.428	1428.57	1785.714	2142.857	2500	2857.143
8	39.06	78.125	156.25	234.375	312.5	625	937.5	1250	1562.5	1875	2187.5	2500
9	34.625	69.44	138.875	208.33	277.75	555.5	833.33	1111.11	1388.88	1666.666	1944.44	2222.72
10	31.25	62.50	125	187.5	250	500	750	1000	1250	1500	1750	2000
15	20.75	41.66	83.33	125	166.66	333.33	500	666.666	833.33	1000	1166.666	1333.33
20	15.625	31.25	62.5	93 75	125	250	375	500	625	750	875	1000
25	12.5	25	50	75	100	200	300	400	500	600	700	800
30	10.375	20.8	41.66	62.5	83.33	166.656	250	333.33	416.666	500	583.33	666.666
35	8.875	17.8	35.7	53.5	71.4	142.8	214.25	285.714	357.143	428.57	500	571.43
40	7.75	15.625	31.25	46.875	62.5	125	187.5	250	312.5	375	437.5	500
45	6.875	13.875	27.75	41.66	55.5	111.11	166.666	222.22	277.77	333.33	388.88	444.44
50	6.25	12.5	25	37.5	50	100	150	200	250	300	350	400
55	5 625	11.33	22.7	34.166	45.4	91	136.33	181.81	227.273	272.73	318.18	363.64
60	5.125	10.4	20.83	31.25	41.66	83.33	125	166.666	208.33	250	291.666	333.33
65	4.75	9.6	19.23	28.8	38.5	76.875	115.33	153.846	192.308	230.77	269.08	307.7
70	4.375	8.9	17.8	26.75	35.6	71.428	107.125	142.857	178.57	214.285	250	285.7
75	4.125	8.33	16.66	25	33 33	66.666	100	133.33	166.666	200	233 33	266.666
80	3.875	7.8	15.625	23.4	31.25	62.5	93 75	125	156.25	187.5	218.75	250
85	3.5	7.33	14.7	22	29.4	58.8	88.2	117.647	147.06	176.47	205.88	235.29
90	3.375	6.9	13.875	20.8	27.75	55 565	83.33	111.11	138.88	166.666	194.44	222.22
95	3.25	6.5	13.166	19 6	26.33	52.625	78.9	105.263	131.579	157.89	184.44	210.53
100	3.135	6.25	12.5	18.75	25	50	75	100	125	150	175	200
150	2.08	4.16	8.33	12.5	16.666	33.33	50	66.666	83.33	100	116.666	133.33
200	1.5	3.125	6.25	9.375	12.5	25	37.5	50	66.5	75	87.5	100
250	1.25	2 5	5	7.5	10	20	30	40	50	60	70	80
300	1.04	2.083	4.166	6.25	8.33	16.666	25	33.33	41.666	50	58.33	66.666
350	0.875	1.75	3.5	5.3	7	14.25	21.428	28.57	35.714	42.86	50	57.143
400	0.75	1.5	3.125	4.6	6.25	12.5	18.75	25	31.25	37.5	43.75	50
450	0.666	1.33	2.75	4.1	5.5	11.11	16.666	22.22	27.77	33.33	38.88	44.44
500	0.625	1.25	2.5	3.75	5	10	15	20	25	30	35	40
600	0.5	1.04	2.083	3.125	4.166	8.33	12.5	16.666	20.83	25	29.666	33.33
700	0.428	0.875	1.75	2.6	3.5	7.142	10.7	14.286	17.857	21.43	25	28.57
800	0.375	0.75	1.5	2.3	3.	6 25	9.375	12.5	15.625	18 75	21.875	25
900	0.333	0.66	1.33	2	2.666	5.5	8.33	11.11	13.88	16.666	19.44	22.22
1000	0.3	0.625	1.25	1.875	2.5	5	7.5	10	12.5	15	17.5	20

The above table may be used to advantage where the **Horse Power is given,** and it is required to know the **amount of water per minute** the Pump will force to a **certain height**; also where the **height the water is to be raised** and the **amount of water needed per minute,** are known, the **required Horse Power** may be ascertained approximately by referring to the elevation (as given in table), and then to the number of gallons nearest the number required, and the Horse Power at the top of the column containing this number, will be the approximate Horse Power required to pump the water.

The power required for pumping water, may be ascertained by application of the **Rules for Capacity and Power,** on page 9. Valuable information and formulas for computing problems in Hydraulics, will be found on page 10.

TABLE SHOWING AMOUNT OF WATER

Discharged per Minute at Different Elevations,

AND POWER REQUIRED TO OPERATE THE PUMP.

(9 to 20 Horse Power.)

Power required for pumping, and gallons of water raised per minute.

Elevation in feet.	9 H. P.	10 H. P.	11 H. P.	12 H. P.	13 H. P.	14 H. P.	15 H. P.	16 H. P.	17 H. P.	18 H. P.	19 H. P.	20 H. P.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
1	22500	25000	27500	30000	32500	35000	37500	40000	42500	45000	47500	50000
2	11250	12500	13750	15000	16250	17500	18750	20000	21250	22500	23750	25000
3	7500	8333.33	9166.66	10000	10833.33	11666.66	12500	13333.33	14166.66	15000	15833.33	16666.66
4	5625	6250	6875	7500	7000	8750	9375	10000	10625	11250	11875	12500
5	4500	5000	5500	6000	6500	7000	7500	8000	8500	9000	9500	10000
6	3750	4166.66	4583.33	5000	5416.66	5833.33	6250	6666.66	7083.33	7500	7916.66	8333.33
7	3214.29	3571.43	3928.57	4285.71	4642.86	5000	5357.143	5714.28	6071.43	6428.57	6785.71	7142.86
8	2812.5	3125	3437.5	3750	4062.5	4375	4687.5	5000	5312.5	5625	5937.5	6250
9	2500	2777.77	3055.55	3333.33	3611.11	3888.88	4166.666	4444.44	4722.22	5000	5277.77	5555.55
10	2250	2500	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000
15	1500	1666.666	1833.33	2000	2166.66	2333.33	2500	2666.66	2833.33	3000	3166.66	3333.33
20	1125	1250	1375	1500	1675	1750	1875	2000	2125	2250	2375	2500
25	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
30	750	833.33	916.666	1000	1083.33	1166.66	1250	1333.33	1416.66	1500	1583.33	1666.66
35	642.86	714.29	785.71	857.143	928.28	1000	1071.43	1142.86	1214.28	1285.71	1357.14	1428.57
40	562.5	625	687.5	750	812.5	875	937.5	1000	1062.5	1125	1187 5	1250
45	500	555.55	611.11	666.666	722.22	777.77	833.33	888.88	944.44	1000	1055.55	1111.11
50	450	500	550	600	650	700	750	800	850	900	950	1000
55	409.1	454.455	500	545.45	590.91	636.36	681.82	727.27	772.73	818.18	863.64	909.9
60	375	416.666	458.33	500	541.66	583.33	625	666.66	708 33	750	791.66	833.33
65	346.15	384 62	423.08	461.54	500	538.46	576.92	615.38	653.85	692.31	730.77	769.23
70	321.43	357.143	392.86	428.57	464.28	500	535.71	571.43	607.14	642.86	678.57	714.28
75	300	333 33	366.666	400	433.33	466.66	500	533.33	566 66	600	633.33	666.66
80	281.25	312 5	343.75	375	406.25	437.5	468.75	500	531.25	562.5	593.75	625
85	264.71	294 12	323.53	352.94	382.35	411.76	441.18	470.59	500	529.41	558.82	588.23
90	250	277 77	305.55	333.33	361.11	388.88	416.666	444.44	472.22	500	527.77	555.55
95	236.84	263 16	290.53	315.79	342.1	368.42	394.74	421.05	447.36	473.68	500	526 31
100	225	250	275	300	325	350	375	400	425	450	475	500
150	150	166 666	183.33	200	216.66	233.33	250	266.66	283.33	300	316.66	333.33
200	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250
250	90	100	110	120	130	140	150	160	170	180	190	200
300	75	83.33	91.666	100	108.33	116.66	125	133.33	141.66	150	158.33	166.66
350	64.29	71.43	78.57	85.71	92.86	100	107.143	114 28	121.43	128.57	135.71	142.86
400	56.25	62.5	68.75	75	81.25	87.5	93.75	100	106.25	112.5	118.75	125.
450	50	55.55	61.11	66.666	72.22	77.77	83.33	88.88	94.44	100	105.55	111.11
500	45	50	55	60	65	70	75	80	85	90	95	100
600	37.5	41 666	45.83	50	54.16	58.33	62.5	66.66	70.83	75	79 16	83.33
700	32.143	35.71	39.285	42.86	46.43	50	53.57	57.14	60.71	64.285	67.86	71.43
800	28.125	31.25	34.375	37.5	40.62	43.75	46.875	50	53.12	56 25	59 37	62 5
900	25	27.77	30.55	33.33	36.11	38.88	41.666	44.44	47.22	50	52.77	55.55
1000	22.5	25	27.5	30	32.5	35	37.5	40	42.5	45	47.5	50

The above table may be used to advantage where the **Horse Power is given,** and it is required to know the **amount of water per minute** the Pump will force to a **certain height**; also where the **height the water is to be raised** and the **amount of water needed per minute,** are known, the **required Horse Power** may be ascertained approximately by referring to the elevation (as given in table), and then to the number of gallons nearest the number required, and the Horse Power at the top of the column containing this number, will be the approximate Horse Power required to pump the water.

The power required for pumping water may be ascertained by application of the **Rules for Capacity and Power** on page 9. Valuable information and formulas for computing problems in Hydraulics, will be found on page 10.

General Classification of Pumps.

Our line of **Iron and Brass Pumps** comprises all the leading styles of Hand and Power Lift and Force Pumps, both Single and Double-acting, also Rotary Pumps for various purposes, and all styles of Cylinders or Working Barrels.

We manufacture the most extensive line of Wind Mill Pumps and Cylinders in the United States, and our reputation for quality in all classes of goods made by us, is second to none.

Every complete article of our manufacture is designated by a **Figure** and **Number** or size, and in ordering, it is only necessary to mention the Figure and Number or size.

Below we give a general classification of Pumps, with the purposes for which they are adapted, and the Figures by which they are known. The page containing description and list may be found by reference to the **Index to Figures** or to the **Alphabetical Classified Index,** which are given on the last pages of this catalogue.

CISTERN PUMPS ARE that class of Lift Pumps adapted for Cisterns or Shallow Wells; but most commonly used in houses for pumping cistern water. This class of Pumps includes what are usually termed **Pitcher Spout Pumps,** as well as the regular styles of Cistern Pumps. The Cylinder is in the stock of Pump, and, therefore, these Pumps will not give satisfactory results located more than about 25 feet above the water. They are designated as *Figs. 118, 119, 120, 121, 122, 123 Cistern Pumps; and *Figs. 125, 126, and 129 Pitcher Spout Pumps.

HOUSE FORCE PUMPS ARE generally used in houses for supplying a tank with cistern water for use in the bath room. Under this head may also be included the Pumps usually called Hand Force Pumps (as well as those termed "House Force Pumps" in the catalogue), and a few other Pumps adapted for the purpose mentioned. These Pumps are much used on plumbing jobs—they should be located within 25 feet of the water, vertically.

The Pumps included in this class are designated as *Figs. 430, 431, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 530, 531, 534, and 535 **Hand Force Pumps**; and *Figs. 520, 521, 522, 524, 526, 541, 542, 543, 545, 546, 556, 558, 559, and 612 **House Force Pumps**; and *Figs. 607 and 608 Horizontal Double-acting Force Pumps.

SHALLOW WELL PUMPS ARE usually denoted as Set-length Lift and Force Pumps. We also include Southern Well Pumps, with Cylinder in the stock, in this class. The Cylinder of Set-length Pumps should not be placed more than 28 feet above the water. The **Lift Pumps,** in this class, are designated as *Figs. 117, 130, 200, 201, 202, 203, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, and 225; and the **Force Pumps,** as *Figs. 219, 220, 221, 223, 226, 250, 275, 422, 442, and 450.

WELL PUMP STANDARDS INCLUDE both Lift and Force Pump Standards for **Shallow and Deep Wells.** They are adapted for various depths of wells, and are listed without Cylinders or Working Barrels. The **Lift Pump Standards** are *Figs. 224 and 228 for **Shallow Wells,** and *Figs. 227, 230, and 232 for **Deep Wells.** The **Force Pump Standards** are *Figs. 229 and 239 for **Shallow Wells,** and *Figs. 231, 233, 584, and 586 for **Deep Wells.**

WIND MILL PUMPS COMPRISE Lift and Force Standards, and Anti-freezing Three-way Pumps, which are all listed without Cylinder, and have Wind-mill Top with handle or lever for hand use. The **Wind Mill Lift Pump Standards** and **Working Heads** are *Figs. 397, 399, 400, 401, 403, 419, and 426.

The **Wind Mill Force Pump Standards** and **Working Heads** are *Figs. 404, 405, 406, 407, 411, 413, 417, 418, 427, 428, 432 and 436. **Anti-freezing Three-way Force Pumps** are *Figs. 410, 415, and 416.

Stuffing-box Heads *Figs. 446, 447, 448 and 449; and **Syphon Pumps,** Figs. 320 and 321, are also included in this class.

POWER FORCE PUMPS. IN this class of Force Pumps may be included *Figs. 500, 501, 480, 481, 486, 487, 603, 605, 613, and 625, **with Pitman** or Rod attachment; and *Figs. 543. 583, 585, 590 and 604 **with Pulleys.** They are used in Factories, Creameries, Quarries, Breweries, and for Irrigating, Fire Protection, and for many other purposes. They should be located within about 25 feet of the water. This class also includes **Deep Well Working Heads** *Figs. 433, 435, 436, and Steam Pump Head *Fig. 438; also *Figs. 584 and 586. They are listed without Cylinder, which can be placed in **any part** of the **Well.**

DOUBLE-ACTING FORCE PUMPS. SOME Pumps in this class are included in other classes, but as our line of these Pumps is large, we give them a separate classification. **"Peerless" Double-acting Pumps** for Shallow and Deep Wells are *Figs. 250, 251, 450, and 451. **Vertical Pumps** with Cylinder in stock are *Figs. 480, 481, 486, 487, 541, 542, 543, and Horizontal Pumps are *Figs. 601, 602, 603, 604, 605, 606, 607, and 608; these Pumps should be placed within 25 feet of the water.

ROTARY FORCE PUMPS. WE make a complete line of Hand and Power Rotary Pumps. Those for Hand are designated as *Figs. 573, 574, 575, 576, 578, and 579 (for hand or power), and those for Power are *Figs. 577, 594, and 595.

These Pumps are positive as Suction and Force Pumps, and throw a constant stream which makes them very desirable for **Fire Protection,** and for use in Chemical Works and Factories of various kinds. They should not be placed more than 20 to 25 feet above the water.

* Description and prices may be found by referring to the **Alphabetical Classified Index** or the **Index to Figures.**

MISCELLANEOUS PUMPS. IN addition to the classes of Pumps enumerated above, we manufacture **Centrifugal Pumps, Air Compression Pumps, Boiler Feed Pumps, Gas Fitters' and Plumbers' Test Pumps, Fire Protection and Garden Force Pumps, Ship Deck Pumps,** etc., description and prices of which may be found by referring to the Alphabetical Classified Index.

CYLINDERS OR WORKING BARRELS. INDEPENDENT Pump Cylinders for Well and Wind Mill Pump Standards and Working Heads, we make in a great variety of styles and sizes adaptable for all kinds of Wells and for various purposes. **Iron Cylinders** are *Figs. 300, 301, 302, 303, 304, 305, 316; they are also made in Cast Brass. **Brass-lined Iron Cylinders** are *Figs. 308, 309, and 310. **Brass Tube Cylinders** are *Figs. 312 and 322. **Artesian Well Cylinders,** *Figs. 314 and 324; and **Deep Well Cylinder,** Fig. 315, are also made of Brass. **Tubular Well Cylinders** are *Figs. 323 and 346. In connection with the description of Cylinders on page 77, we give a **table showing the outside diameters of all Cylinders** used in Open and Drilled Wells. This will facilitate the choice of Cylinder for Drilled Wells since the size Pipe or Casing it will go in, can be determined at a glance.

PUMP FIXTURES. PRICES of the various auxiliaries and attachments for Pumps, such as Strainers, Check Valves, Foot Valves, Float Valves, Goose-necks, Wind Mill Connections, Rod Couplings, Handle Balls, etc., may be found by reference to the Alphabetical Classified Index.

THE HYDRAULIC RAM MAY be used for so many purposes, and will operate under such a variety of conditions, that we refer to the description and price list; also to the Table showing various specifications for locating and operating the Hydraulic Ram, on pages 162 and 163.

WELLS OF VARIOUS KINDS. THE many different geological strata under the surface of the ground have made it necessary to reach the water channels by different methods. Where an underground water channel occurs in gravel, say 15 to 25 feet below the surface, with no intervening obstructions, and as layers of stone, boulders, etc., the **Driven Well** may be used; and on account of its cheapness, its use has become quite extensive. With **Driven Wells,** our Set-length Pumps are generally used in connection with a Drive Well Point on the end of the suction pipe.

The **Open or Dug Well** may be made either where the water channels are shallow or deep; and any style of Pump may be used, depending on the depth of well or distance to the water. See Directions for ordering and Table of **Approximate sizes of Cylinders in various Depths of Wells.**

The **Drilled Well** is most in vogue where the water channels are very deep or below several strata of hard rock. Usually the well is walled with Iron Pipe or well Casing, down to the rock. Any of our Well or Wind Mill Pump Standards may be used in connection with an independent Cylinder of an outside diameter that will go in the well. This may be determined by reference to the **table showing outside diameter of Cylinders** given on page 77.

Artesian Wells, strictly speaking, are **Driven, Drilled,** or **Tubular Wells,** wherefrom the water flows above the surface of the ground; but the Drilled Wells, wherein an abundance of water raises within, say 25 feet of surface, are now also termed **Artesian Wells**; and even Deep Wells where the water is lower, but **inexhaustible** in its supply, are generally termed Artesian Wells.

TUBULAR WELLS ARE constructed with Iron Pipe or Casing for the walls of the well, and the Cylinder is either a part of the same, or it is set down in the well in a secure position, with a Strainer Well Point below, so that the Plunger and Lower Valve can easily be removed for repairs. The "Eureka" Tubular Well Cylinder is the best thing of the kind ever invented; it is illustrated and described on pages 86 and 87.

IN ORDERING WELL or Wind Mill Pumps fitted up ready to set in the well, we should know the distance from the surface of the ground (or platform for the Pump) to the bottom of the well, also the average depth of water in the well at different seasons of the year. If it is a Drilled Well, the diameter of Pipe or Casing should be known. Large sizes of Suction and Discharge Pipe are desirable, because the friction of water in the Pipes is reduced. The *velocity* of a given amount of water discharged through a Pipe of a certain diameter is less than through a smaller Pipe.

WHEN NECESSARY FOR a **Well Pump Cylinder** to be placed above the water (as well as in the case of Pumps with Cylinder in the stock), it is often desirable to place a Foot Valve or Strainer on the end of the Suction Pipe. The Foot Valve **checks the water** and prevents its flowing back, so that everything being in working order, the Pump will seldom need priming.

The table below may be useful in deciding the size Cylinder to use for Well or Wind Mill Pumps in wells of different depth; also the sizes of Suction and Discharge Pipe for Cylinders of certain diameter.

*Description and prices may be found by referring to the **Alphabetical Classified Index** or the **Index to Figures.**

APPROXIMATE SIZES OF CYLINDERS
FOR WELLS OF VARIOUS DEPTH.
(FOR HAND AND WIND MILL PUMPS.)

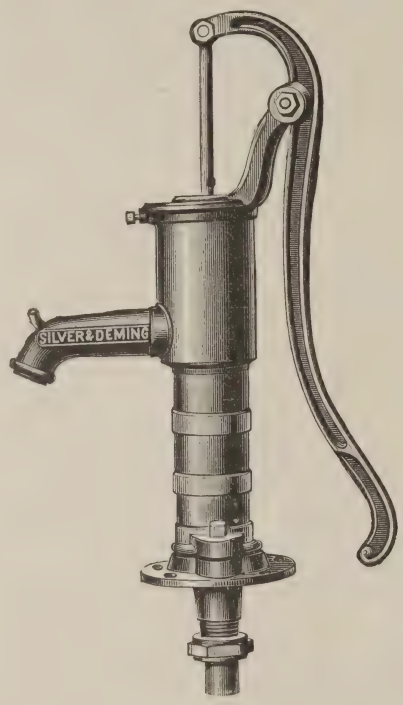
Diameter of Cylinder in Inches (this size or *less*)	4	3½	3	2½	2¼	2
Diameter of Suction and Discharge Pipe (this size or *greater*)	2	1½	1¼	1¼	1¼	1
Depth of Well in feet (this depth or *less*)	25	50	75	100	150	200

Revolving Top Cistern Pump.

EASTERN STYLE.

WITH BOLTED BASE, BORED AND POLISHED CYLINDER.

FIG. 120.



The above cut represents **Fig. 120,** a Cistern Pump with Bolted Base, Bored and Polished Cylinder. The Fulcrum or Bearer (top of Pump) will revolve, so that the Lever or Handle may be used in any desired position. The Plunger is attached to the rod by a **hinged joint,** so that the Cylinder is always worn smooth, on account of the Plunger having a direct vertical motion in the Cylinder. Pumps of this class (with the Cylinder in the stock) will operate where the water is not over thirty feet below the Pump; and the horizontal distance to the water does not materially affect its working; though in any case a Foot Valve on the end of suction pipe is advantageous.

Freezing may be prevented by raising the lever to its extreme height, which trips the valves and allows the water to flow back after pumping. **Figs. 120 and 121 for Export Trade** are in great demand, since they are **light, compact and durable.** Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	† Fitted For	Stroke.	Weight.	IRON.		BRASS CYL.		*BRASS.	
					Cipher.	Price	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in. Pipe.	4 inch.	15 lbs.	Abacus	$3.50	Abdominal	$ 5.50	Abject	$ 7.75
1	2¼ "	1 " "	5 "	19 "	Abbacy	4.00	Aberrant	6.00	Abjectly	8.75
2	2½ "	1¼ " "	5 "	24 "	Abbot	4.50	Aberration	7.00	Abjectness	10.50
3	2¾ "	1¼ " "	6 "	27 "	Abbreviate	5.00	Abeyance	8.00	Abjured	14.00
4	3 "	1½ " "	7 "	35 "	Abdicate	5.50	Abhorrent	10.00	Ablution	17.00
5	3¼ "	1½ " "	7 "	47 "	Abdication	6 50	Abiding	13.00	Abnegate	21.00
6	3½ "	2 " "	8 "	53 "	Abdomen	8.00	Ability	18.00	Abnormal	27.00

† Fitted for other sizes of Pipe, American or Foreign, but always for American Pipe, as listed, unless otherwise ordered.

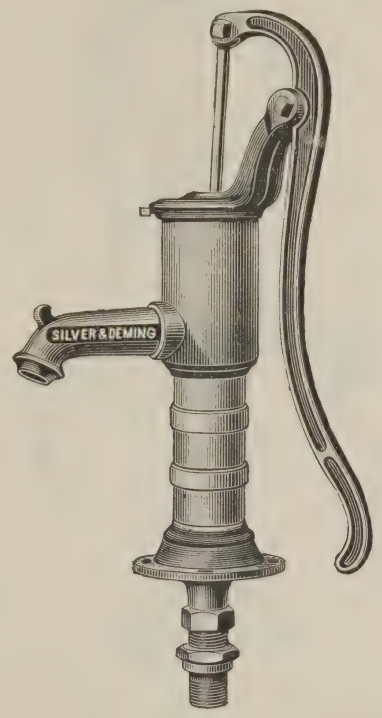
* All Brass except Lever, Bearer and Base.

Revolving Top Cistern Pump.

EASTERN STYLE.

WITH SCREWED BASE, BORED AND POLISHED CYLINDER.

FIG. 121.



This Pump is similar to **Fig. 120,** shown on the preceding page. It differs, however, in the construction of the base, which is screwed to the stock or cylinder, whereas in **Fig. 120** the base is bolted to the cylinder. In all other respects these Pumps are identical. As before stated, Pumps of this class (with the working barrel or cylinder in stock of Pump) are not adapted for raising water practically over thirty feet vertical distance. To prevent freezing, trip the valves by raising the lever to its extreme height. Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	† Fitted For	Stroke.	Weight.	IRON.		BRASS CYL.		* BRASS.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 in.	1 in. Pipe.	4 inch.	15 lbs.	Abandon	$3.50	Abettor	$ 5.50	Abridge	$ 7.75
1	2¼ "	1 " "	5 "	19 "	Abash	4.00	Abhor	6.00	Abroach	8.75
2	2½ "	1¼ " "	5 "	24 "	Abate	4.50	Aboard	7.00	Abrupt	10.50
3	2¾ "	1¼ " "	6 "	27 "	Abating	5.00	Abode	8.00	Abscond	14.00
4	3 "	1½ " "	7 "	35 "	Abbess	5.50	Abolish	10.00	Abstain	17.00
5	3¼ "	1½ " "	7 "	47 "	Abbey	6.50	Abortive	13.00	Absurd	21.00
6	3½ "	2 " "	8 "	53 "	Abduct	8.00	Abound	18.00	Abuse	27.00

† Fitted for other sizes of Pipe, American or Foreign, but always for American Pipe, as listed, unless otherwise ordered.

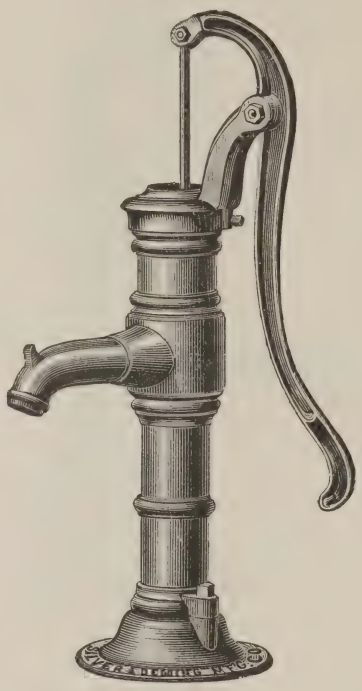
* All Brass except Lever, Bearer, and Base.

Revolving Top Cistern Pump.

WESTERN STYLE.

WITH BOLTED BASE, BORED AND POLISHED CYLINDER

FIG. 123.



This Pump is in general construction like **Fig. 120**, but differs from the latter in the connection of the plunger and rod; also in the base and coupling for pipe. The valve seat and pipe coupling are combined in the shape of a flanged cast-brass Tube, the bottom of which is threaded for iron pipe coupling; this tube is also used for soldering to lead pipe, when the latter is used.

Fig. 123 is taller than our Eastern styles of Cistern Pumps. It is substantial in every respect. Being the standard style of Cistern Pump in the Western trade, its sale is very extensive. To prevent freezing, trip the valves by raising the lever to its extreme height. Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	†Fitted For	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 inch Pipe.	6 inch.	Accent	$3.50	Adamant	$ 5.50	Admiral	$ 7.75
1	2¼ "	1 " "	6 "	Acclaim	4.00	Adder	6.00	Admire	8.75
2	2½ "	1¼ " "	6 "	Accord	4.50	Addling	7.00	Admix	10.50
3	2¾ "	1¼ " "	6 "	Acquaint	5.00	Adept	8.00	Adore	14.00
4	3 "	1¼ " "	6 "	Acquitted	5.50	Adjourn	10.00	Adorning	17.00
5	3¼ "	1½ " "	6 "	Acute	6.50	Adjunct	13.00	Adrift	21.00
6	3½ "	2 " "	6 "	Adage	8.00	Adjure	18.00	Advent	27.00

† Fitted for other sizes of Pipe, but always as listed, unless otherwise ordered.

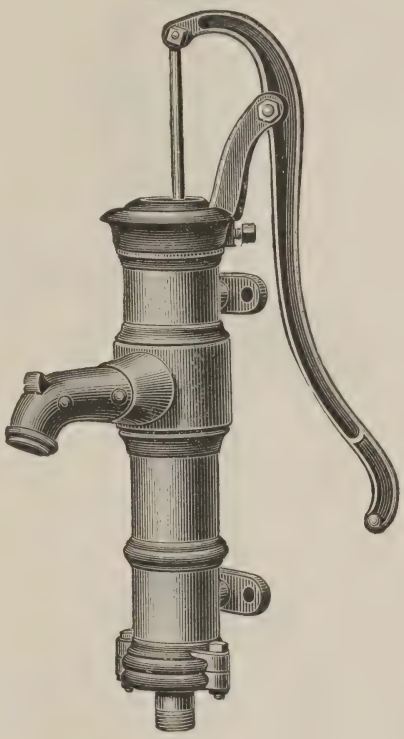
* All Brass except Lever, Bearer, and Base.

Revolving Top Cistern Pump.

WESTERN STYLE.

WITH BRACKETS, BORED AND POLISHED CYLINDER.

FIG. 119.



The above cut represents a Cistern Pump with wall brackets, by means of which it can be placed in positions where a Pump with base could not be used. This Pump is similar to **Fig. 123** in the construction of its working parts. To prevent freezing, trip the valves by raising the lever to its extreme height.

Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	† Fitted For	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 in. Pipe.	6 inch.	Afar	$3 50	Affright	$ 5.50	Aground	$ 7.75
1	2¼ "	1 " "	6 "	Affable	4.00	Afoot	6.00	Alarmed	8.75
2	2½ "	1¼ " "	6 "	Affect	4.50	Afresh	7.00	Album	10.50
3	2¾ "	1¼ " "	6 "	Affiance	5.00	Agate	8.00	Alcove	14.00
4	3 "	1¼ " "	6 "	Affiant	5.50	Aghast	10.00	Alight	17.00
5	3¼ "	1½ " "	6 "	Affirm	6.50	Agility	13.00	Alotted	21.00
6	3½ "	2 " "	6 "	Affray	8.00	Agony	18.00	Alotting	27.00

† Fitted for other sizes of Pipe, but always as listed, unless otherwise ordered.

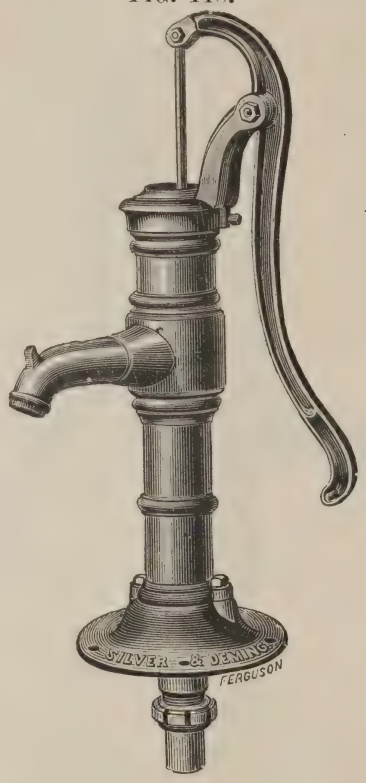
* All Brass except Lever, Bearer, and Base.

Revolving Top Cistern Pump.

WESTERN STYLE.

WITH BOLTED BASE, BORED AND POLISHED CYLINDER.

FIG. 118.



The above cut represents a style of Pump similar in construction and adaptability to **Figs. 120** and **123**. It is made with a broad, low base and, like **Fig. 123**, is taller than the Eastern style Cistern Pumps. In the couplings for lead and iron pipe it is like **Fig. 120**; and in other respects, except in the shape of its base, it is like **Fig. 123**.

To prevent freezing, trip the valves by raising the lever to its extreme height.

Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	† Fitted For	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 in. Pipe.	6 inch.	Allude	$3.50	Alum	$ 5.50	Amour	$ 7.75
1	2¼ "	1 " "	6 "	Alluding	4.00	Amass	6.00	Amorous	8.75
2	2½ "	1¼ " "	6 "	Almanac	4.50	Amber	7.00	Amusing	10.50
3	2¾ "	1¼ " "	6 "	Almond	5.00	Ambush	8.00	Anagram	14.00
4	3 "	1¼ " "	6 "	Aloud	5.50	Amend	10.00	Anchor	17.00
5	3¼ "	1½ " "	6 "	Alpine	6.50	Amid	13.00	Angling	21.00
6	3½ "	2 " "	6 "	Altar	8.00	Amity	18.00	Anguish	27.00

† Fitted for other sizes of Pipe, but always as listed, unless otherwise ordered.

* All Brass except Lever, Bearer, and Base.

Revolving Top Cistern Pump.

EASTERN STYLE.

WITH BOLTED BASE, DOUBLE ROD, AND PISTON GUIDE.

FIG. 122.

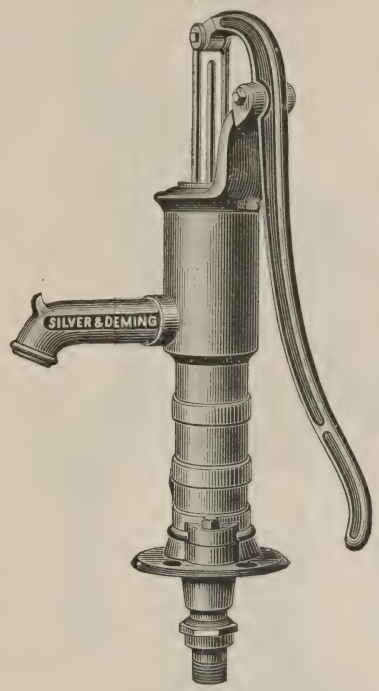


Fig. 122 represents a style of Cistern Pump in which all working parts are constructed in the most perfect manner. The double rod and piston guide gives a direct vertical motion to the plunger, so that it works perfectly true in the cylinder. In general construction, this Pump is similar to **Fig. 120.**

This Pump is furnished with metallic fitted valves for pumping hot liquids, etc., if desired, at extra net prices given below. To prevent freezing, trip the valves by raising the lever to its extreme height. Fitted for both Lead and Iron Pipe, and with Brass Valve Seat.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	†Fitted For	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ in.	1 in. Pipe.	5 in.	Angular	$4.50	Annoy	$6.50	Anvil	$9.50
2	2½ "	1¼ " "	5 "	Animal	5.00	Anoint	7.50	Apace	12.25
3	2¾ "	1¼ " "	6 "	Annexed	5 50	Anthem	8.50	Apex	15.50
4	3 "	1½ " "	7 "	Animate	6.25	Antics	10.75	Aping	19.25
5	3¼ "	1½ " "	7 "	Ankle	7 50	Anthony	14.00	Apollo	24.50
6	3½ "	2 " "	8 "	Announce	9 00	Antler	10.00	Apostle	34.50

† Fitted for other sizes of Pipe, American or Foreign, but always for American Pipe, as listed, unless otherwise ordered.

* All Brass except Lever, Bearer, and Base.

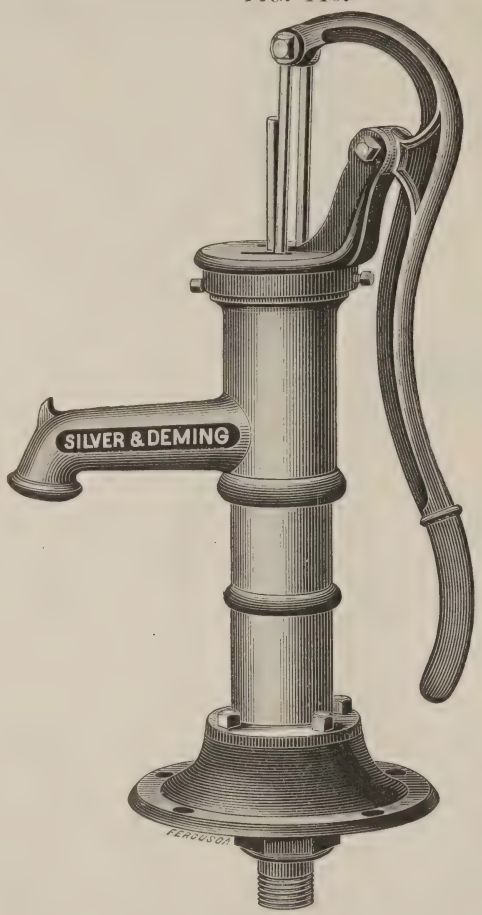
Prices of Metallic Valves for Cistern Pumps.

No. 0, ... $1.25 net extra.
No. 1, ... 1.25 " "
No. 2, ... 1.50 " "
No. 3, ... 1.65 " "
No. 4, ... $1.75 net extra.
No. 5, ... 2.00 " "
No. 6, ... 2.25 " "

Molasses or Hot Liquid Pump.

WITH METALLIC FITTED VALVES.

FIG. 140.



This cut represents **Fig. 140,** a pump with metallic fitted valves and piston-rod guide, which features insure its perfect working, and adapt it for pumping molasses, oils, hot water, or any hot liquids or syrups.

The Brass Pumps of this style are made entirely of that metal in those parts which come in contact with the liquid.

When used for hot water or other hot liquid, the Pump should be placed as near to it as possible to prevent destruction of the vacuum by the steam or vapor. Fitted for both Lead and Iron Pipe.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	† Fitted For	IRON.		* BRASS.	
			Cipher.	Price.	Cipher.	Price.
4	2½ inch.	1¼ inch pipe.	Apparel	12.00	Apron	20.00
5	3 "	1½ " "	Appeach	15.00	Arabian	25.00
6	3½ "	1½ " "	Append	17 00	Arbor	30.00
7	4 "	2 " "	Applause	21 00	Arcade	36.00
8	4½ "	2½ " "	Apple	25 00	Ardent	42.00

† Fitted for other sizes of Pipe, American or Foreign, but always for American Pipe, as listed, unless otherwise ordered.

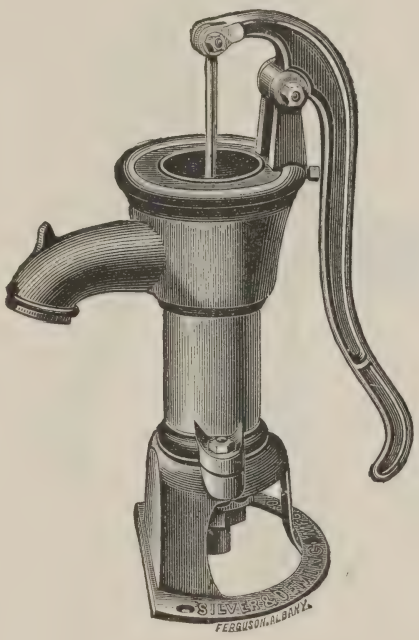
* All Brass except Lever, Bearer, and Base.

IMPROVED

Close-Spout Pitcher Pump.

WITH ADJUSTABLE LEVER AND CUT-OFF BASE.

FIG. 129.



The above cut represents, **Fig. 129**, our Pitcher Pump, with close spout, which, in some localities, is preferred for cistern use to the other styles of Pitcher Spout Pumps—illustrated and described on the following pages. This Pump has a projection on spout for holding a bucket while pumping. It is constructed with Revolving Top, so that it may be used either right or left handed, and is arranged with couplings for either Iron or Lead Pipe. This Pump is always furnished with Brass Valve Seat. To prevent freezing, trip the valves, by raising the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

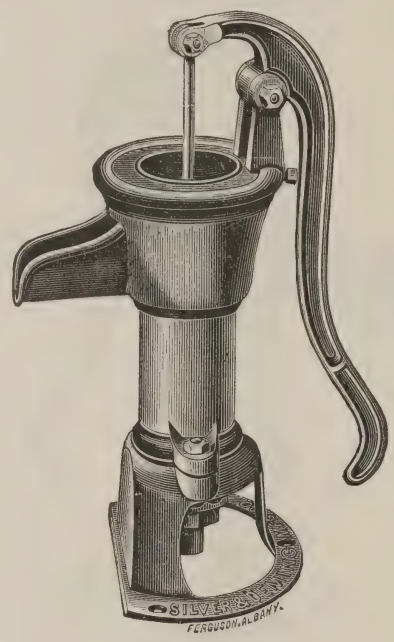
No.	Size Cyl.	Fitted For	Stroke.	IRON.		BRASS-LINED CYL.		BRASS CYL.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	1 in. Pipe.	4 inch.	Argentic	$4.25	Artistic	$6.50	Asleep	$ 7.00
2	3 "	1¼ " "	4 "	Arming	4.75	Ashamed	7.25	Aspect	10.00
3	3½ "	1¼ " "	4 "	Armory	5.25	Ashore	8.00	Assail	12.00
4	4 "	1½ " "	4½ "	Arsenal	5.75	Aside	9.00	Assault	14.00

IMPROVED

Close-Top Pitcher Spout Pump.

WITH ADJUSTABLE LEVER AND CUT-OFF BASE.

FIG. 125.



The above illustration represents our Improved Pitcher Spout Pump with Close Top, a style that is in universal favor for house use, where a cheap and substantial Cistern Pump is wanted. The cylinders are bored perfectly true and highly polished. The suction pipe attachment is arranged by a projecting hub at the bottom of the base, on which is screwed a coupling nut, threaded for gas pipe; through this a brass soldering tube is introduced for connecting to lead pipe, if desired. All parts are made to exact gauges; so that repairs will always fit. To prevent freezing, trip valves by raising lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

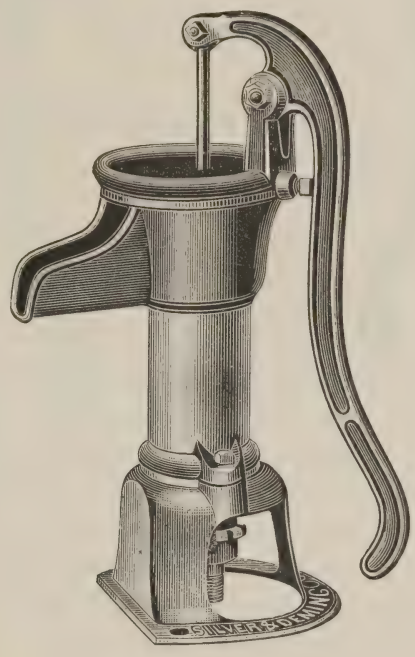
No.	Size Cyl.	Fitted For	Stroke.	IRON.		BRASS-LINED CYL.		BRASS CYL.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1 inch pipe.	4 inch.	Assay	$4.25	Astound	$6.50	Attract	$ 7.00
2	3 "	1¼ " "	4 "	Assayed	4.75	Astray	7.25	Audit	10.00
3	3½ "	1¼ " "	4 "	Assent	5.25	Asunder	8.00	Auditor	12.00
4	4 "	1½ " "	4½ "	Assign	5.75	Atoning	9.00	Augment	14.00
5	4½ "	2 " "	5 "	Assuage	6.25	Attain	10.00	Auntless	16.00

IMPROVED

Open-Top Pitcher Spout Pump.

WITH ADJUSTABLE LEVER AND CUT-OFF BASE.

FIG. 126.



The Pump represented by the above cut, is exactly the same as **Fig. 125**, except in the construction of the top or bearer, which in **Fig. 126** is open, so that the water flows up and out the spout in full view. If desired, the rod may be uncoupled and the plunger drawn out without removing the bearer and lever.

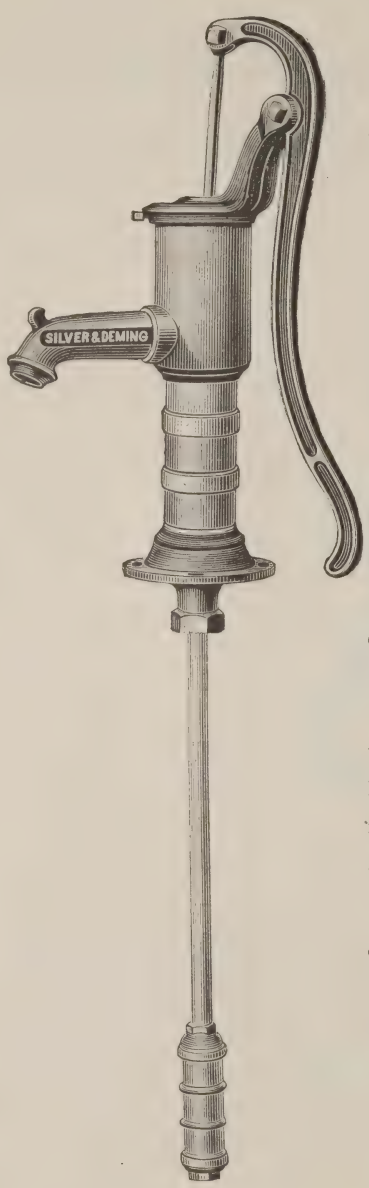
The greater part of our trade on this class of Pumps is for **Fig. 125**, but in some localities **Fig. 126** is preferred.

To prevent freezing, raise the lever to its extreme height. All parts made to gauges, so that repairs will always fit.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	Stroke.	IRON.		BRASS-LINED CYL.		BRASS CYL.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1 in. Pipe.	4 in.	Author	$4.25	Avenging	$ 6.50	Award	$ 7.00
2	3 "	1¼ " "	4 "	Avail	4.75	Avowed	7.25	Awarded	10.00
3	3½ "	1¼ " "	4 "	Avaunt	5.25	Avowal	8.00	Awful	12.00
4	4 "	1½ " "	4½ "	Avenge	5.75	Awake	9.00	Awkward	14.00
5	4½ "	2 " "	5 "	Avenged	6.25	Awaken	10.00	Awning	16.00



Anti-Freezing Cistern Pump.

WITH WROUGHT-IRON SET-LENGTH.

FIG. 117.

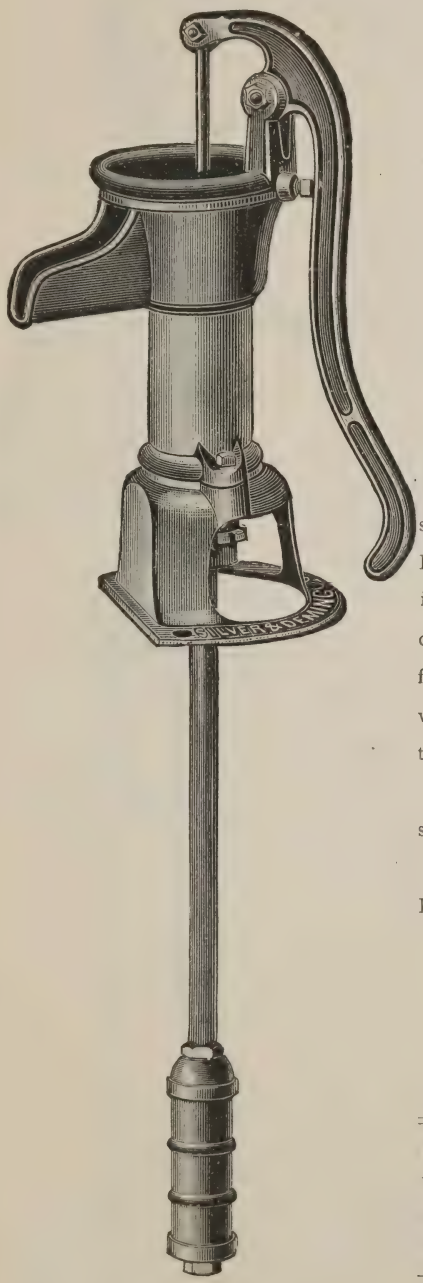
The Pump illustrated herewith is the same as Cistern Pump **Fig. 121**, with the plunger and valves omitted, and a set-length pipe connecting to a cylinder, or working barrel below. This arrangement renders the Pump a desirable one for *out-door* use, in cisterns and shallow wells, where frost would effect the ordinary Cistern Pump. It is also adapted for deeper wells than the latter, on account of the set-length pipe, which can be lengthened still more if desired. To prevent freezing, a small hole is made about three feet below the base, just above the cylinder, which allows the water to flow back from stock of Pump.

We fit these Pumps with bolted cylinders at same list prices, when so ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Fitted For	Stroke.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	6 inch.	Babble	$6.00
2	2½ "	1¼ " "	6 "	Babel	6.50
3	2¾ "	1¼ " "	6 "	Backing	7.00
4	3 "	1¼ " "	6 "	Baffled	7.50
5	3¼ "	1½ " "	6 "	Baffling	8.00
6	3½ "	2 " "	6 "	Baking	9.00



Anti-Freezing Pitcher Spout Pump.

WITH WROUGHT-IRON SET-LENGTH.

FIG. 130.

The annexed cut represents **Fig. 130,** a Pitcher Spout Pump with set-length pipe and independent cylinder or working barrel. This Pump is similar in construction and adaptability to **Fig. 117,** and like it, is rendered anti-freezing by a drip-hole in the pipe just above the cylinder. **Fig. 130** may be used in wells or cisterns over twenty-eight feet deep, by lowering the cylinder to a convenient distance from the water. The set-length pipe is about three feet in length, which sets the cylinder below the frost line.

We fit these Pumps with bolted cylinders at same list prices, when so ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	Stroke.	Cipher.	Price.
1	2½ inch.	1¼ inch Pipe.	6 inch.	Balder	$6.75
2	3 "	1¼ " "	6 "	Baltic	7.75
3	3½ "	1½ " "	6 "	Bandit	8.75
4	4 "	2 " "	6 "	Bantam	9.50

Anti-Freezing Cistern and Well Pumps.

FIG. 201—Open-Top.

FIG. 203—Tight-Top.

WITH CAST-IRON SET-LENGTH.

These Pumps represent our Cistern and Well Pumps with cast-iron set-length, suitable for cisterns or wells not over thirty feet deep. The inside diameter of the set-length pipe is enough larger than the diameter of the cylinder to admit of the Plunger being drawn up through the stock of pump by detaching the handle and bearer. This facilitates the work of repairing the plunger, and with Drop Bucket lower valve (which we furnish when ordered), all repairing of valves can be done without removing the Pump.

Figs. 201 and **203** are the same in construction, except that the former is arranged with open top, and the latter with tight top.

A drip hole in set-length pipe allows water to flow back and prevents freezing.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Fitted For	Stroke.	* Fig. 201.		* Fig. 203.	
				Cipher.	Price.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	6 inch	Bantered	$7.50	Barren	$8.25
2	2½ "	1¼ " "	6 "	Barbered	8.00	Basely	8.75
3	2¾ "	1¼ " "	6 "	Barbing	8.50	Baseness	9.25
4	3 "	1¼ " "	6 "	Baronet	9.00	Basement	9.75

* With Drop Bucket lower valve, add $2.00 to list.

IMPROVED

Anti-Freezing Well Pumps.

FIG. 200—Open-Top.

WITH WROUGHT-IRON SET-LENGTH.

The Pumps illustrated on this page have been long and favorably known in most parts of the country. They are adapted to wells not over thirty feet in depth, and they are rendered anti-freezing by a drip hole in the set-length pipe directly above the cylinder, about three feet below base of Pump.

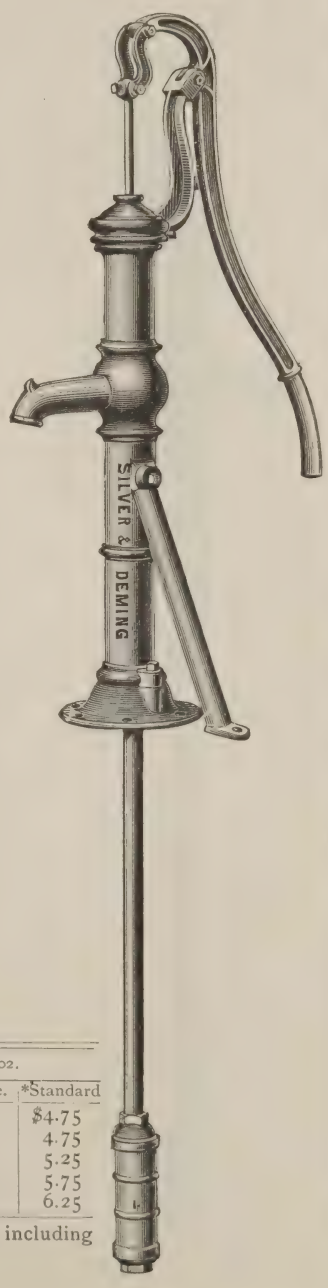
When the cylinder is lowered to within fifteen or twenty feet of the water, these Pumps will do good service in wells forty to fifty feet deep.

The Tight Top Pump, **Fig. 202,** is preferred in some cases on account of the direct vertical motion of the piston-rod; and that no stones or dirt can be thrown into it, which might prevent its working.

These Pumps are equally adapted for open and driven wells. Always furnished with raised sand valve seat. Repairs will always fit. Length of stroke six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

FIG. 202—Tight-Top.



Sizes and Prices.

No.	Size Cyl.	Fitted For	Fig. 200.			Fig. 202.		
			Cipher.	Price.	*Standard	Cipher.	Price.	*Standard
1	2¼ inch	1 in. Pipe	Bashful	$7.00	$4.00	Beadle	$7.75	$4.75
2	2½ "	1¼ "	Basin	7.50	4.00	Beamed	8.25	4.75
3	2¾ "	1¼ "	Basting	8.00	4.50	Beaming	8.75	5.25
4	3 "	1¼ "	Batter	8.50	5.00	Bearded	9.25	5.75
5	3¼ "	1¼ "	Batting	9.00	5.50	Beastly	9.75	6.25

* The "Standard" means complete parts of Pump above, and including the base. The "Cipher" applies only to the complete Pump.

IMPROVED
Anti-Freezing Well Pumps.

WITH OPEN-TOP.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIG. 210—Light Standard

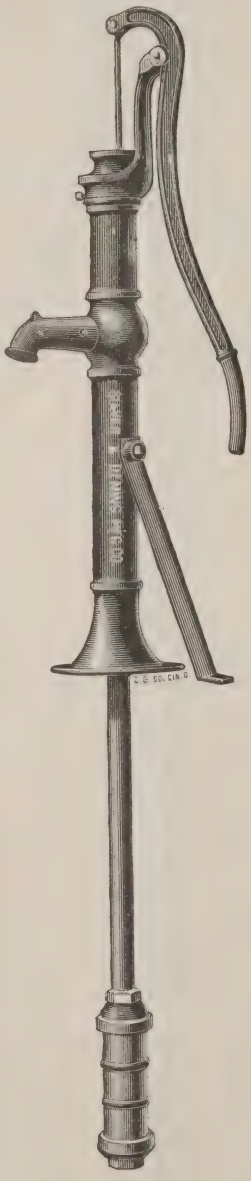


FIG. 211—Medium Standard.

FIG. 212—Heavy Standard.

Description and lists of these Pumps will be found on the next page.

IMPROVED
Anti-Freezing Well Pumps.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIGS. 210, 211, and 212.

The Pumps, illustrated on the preceding page, are similar in design, the only difference being in the sizes and weights of the standards. As listed, each size of the series may be used in wells of about twenty-eight feet in depth; but by lowering the cylinder to within fifteen or twenty feet of the water, the medium and heavy Pumps, **Figs. 211** and **212**, are adapted for wells fifty to sixty feet deep. The bases of these Pumps are cast solid on the stock, and set-length pipes are connected under the spout, thus causing delivery of the water after a few strokes of the handle, and preventing effect from frost by the air space between the pipe and stock of Pump. These Pumps may be used in both open and driven wells. Always furnished with raised sand valve seat. Length of stroke, 6 inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.—With Iron Cylinders.

SIZES AND FITTINGS.			Fig. 210.		Fig. 211.		Fig. 212.	
No.	Size Cylinder.	Fitted For	Height, 44 in. Base to Top.		Height, 45 in. Base to Top.		Height, 47 in. Base to Top.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inches.	1 inch. Pipe.	Beaver	$7.75	. . . . .	. . . .	. . . . .	. . . .
2	2½ "	1¼ " "	Bedded	8.00	Begrudge	$8.50	. . . . .	. . . .
3	2¾ "	1¼ " "	Bedding	8.25	Behest	8.75	Besiege	$9.25
4	3 "	1¼ " "	Beetle	8 50	Bemoan	9.00	Beseech	9.50
5	3¼ "	1¼ " "	Befall	8.75	Benumb	9.25	Besought	9.75
6	3½ "	1½ " "	. . . . .	. . . .	Bequest	9.75	Betide	10.25
8	4 "	2 " "	. . . . .	. . . .	. . . . .	. . . .	Betoken	11.50

Sizes and Prices.—With Brass-Lined Cylinders.

SIZES AND FITTINGS.			Fig. 210.		Fig. 211.		Fig. 212.	
No.	Size Cylinder.	Fitted For	Height, 44 in. Base to Top.		Height, 45 in. Base to Top.		Height, 47 in. Base to Top.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inches.	1 inch. Pipe.	Betroth	$10.00	. . . . .	. . . .	. . . . .	. . . .
2	2½ "	1¼ " "	Betrothal	10.25	Bigotry	$10.75	. . . . .	. . . .
3	2¾ "	1¼ " "	Bewitch	10.50	Bilious	11.00	Bismuth	$11.50
4	3 "	1¼ " "	Bewitched	11.00	Billiards	11.50	Bison	12.00
5	3¼ "	1¼ " "	Bigness	11.50	Biped	12.00	Blacked	12.50
6	3½ "	1½ " "	. . . . .	. . . .	Birthday	12.75	Blacking	13.25
8	4 "	2 " "	. . . . .	. . . .	. . . . .	. . .	Blame	15 00

IMPROVED
Anti-Freezing Well Pumps.

WITH TIGHT-TOP.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIG. 213—Light Standard.

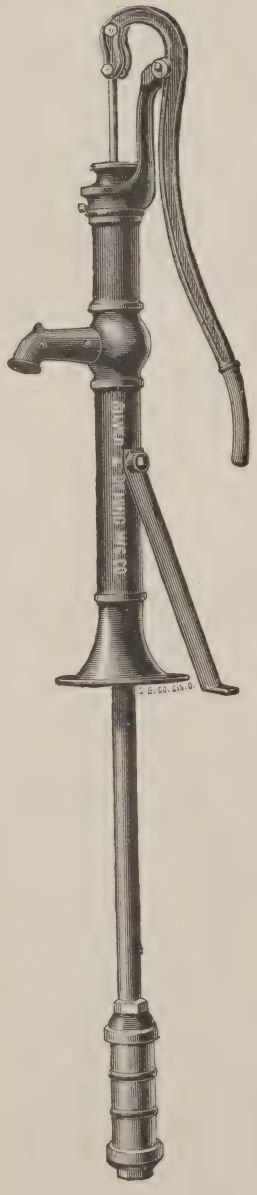


FIG. 214—Medium Standard.

FIG. 215—Heavy Standard.

Description and lists of these Pumps will be found on the next page.

IMPROVED

Anti-Freezing Well Pumps.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIGS. 213, 214, and 215.

The Pumps, **Figs. 213, 214, and 215,** represented by cuts on the preceding page, are similar to **Figs. 210, 211, and 212,** respectively; the only difference being that the former are constructed with tight tops, which give a direct vertical motion to the piston-rod and prevent foreign substances from getting into the working parts through the top of Pump. In many sections of the country, these are preferred to the open-top style of Pump. The bases being cast solid on the stock and the set-length pipe connecting under the spout renders these Pumps more substantial, with less liability to damage by frost than the Pumps with bolted or screwed base. These Pumps are adapted to open or driven wells. They are always furnished with raised sand valve seat to lower valve. Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.—With Iron Cylinders.

SIZES AND FITTINGS.			Fig. 213.		Fig. 214.		Fig. 215.	
No.	Size Cylinder.	Fitted For	Height, 47 in. Base to Top.		Height, 48 in. Base to Top.		Height, 50 in Base to Top.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	Blamed	$ 8.50	. . . . .		. . . . .	. . . .
2	2½ "	1¼ " "	Blameless	8.75	Blended	$ 9.25	. . . . .	. . . .
3	2¾ "	1¼ " "	Blaming	9.00	Blender	9.50	Bloated	$ 10.00
4	3 "	1¼ " "	Blarney	9.25	Blighted	9.75	Bloomed	10.25
5	3¼ "	1¼ " "	Bleeding	9.50	Blighting	10.00	Bloomer	10.50
6	3½ "	1½ " "	. . . . .	. . . . .	Blistered	10.50	Blooming	11.00
8	4 "	2 " "	. . . . .	. . . . .	. . . . .	. . . . .	Blotched	12.25

Sizes and Prices.—With Brass-Lined Cylinders.

SIZES AND FITTINGS.			Fig. 213.		Fig. 214.		Fig. 215.	
No.	Size Cylinder.	Fitted For	Height, 47 in. Base to Top.		Height, 48 in. Base to Top.		Height, 50 in. Base to Top.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	Blouse	$10.75	. . . . .	. . . .	. . . . .	. . . .
2	2½ "	1¼ " "	Blowing	11.00	Bluffed	$ 11.50	. . . . .	. . . .
3	2¾ "	1¼ " "	Blockade	11.25	Bluffer	11.75	Blunted	$12.25
4	3 "	1¼ " "	Blocking	11.75	Bluffing	12.25	Blunting	12.75
5	3¼ "	1¼ " "	Bluebird	12.25	Blunder	12.75	Bluntly	13.25
6	3½ "	1½ " "	. . . . .	. . . .	Blundering	13.50	Bluster	14.00
8	4 "	2 " "	. . . . .	. . . . .	. . . . .	. . . .	Blustering	15.75

SPECIAL
Anti-Freezing Wind Mill Pumps.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIG. 420—Light Standard.

FIG. 421—Medium Standard.

FIG. 423—Heavy Standard.

Description and lists of these Pumps will be found on the next page.

SPECIAL

Anti-Freezing Wind Mill Pumps.

SET-LENGTH PIPE CONNECTED UNDER SPOUT.

FIGS. 420, 421, and 423.

The Pumps illustrated on the preceding page correspond with **Figs 213, 214, and 215** respectively, both in dimensions and adaptability; the difference being in the construction of the tops and handles. In addition to adapting these Pumps for use with Wind Mill, this top gives, as in the preceding series of Pumps, a vertical motion to the piston-rod, preventing an uneven action of the plunger in the cylinder.

The flat rod of these Pumps fits the top tightly; and the same may be said of them in this respect, as is said of **Figs. 213, 214, and 215,** *i. e.*, dirt and stones or other foreign substances cannot be thrown into the Pump to prevent its working.

These Pumps are made anti-freezing in the same way as are the preceding two series of Well Pumps. Repairs will always fit.

Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.—With Iron Cylinders.

SIZES AND FITTINGS.			Fig. 420.		Fig. 421.		Fig. 423.	
No.	Size Cylinder.	Fitted For	Height, 44 in. Base to Top Guide.		Height, 45 in. Base to Top Guide.		Height, 47 in. Base to Top Guide.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	Boarded	$8.75	. . . . .	. . . .	. . . . .	. . . .
2	2½ "	1¼ " "	Boarding	9.00	Boatswain	$ 9.50	. . . . .	. . . .
3	2¾ "	1¼ " "	Boasted	9.25	Bobbin	9.75	Bobtail	$10.25
4	3 "	1¼ " "	Boastful	9.50	Bobbinet	10.00	Bobtailed	10.50
5	3¼ "	1¼ " "	Boating	9.75	Bobbing	10.25	Bobwhite	10.75
6	3½ "	1½ " "	. . . . .	. . . .	Bobolink	10.75	Bocking	11.25
8	4 "	2 " "	. . . . .	. . . .	. . . . .	. . . .	Bodeful	12.50

Sizes and Prices.—With Brass-Lined Cylinders.

SIZES AND FITTINGS.			Fig. 420.		Fig. 421.		Fig. 423.	
No.	Size Cylinder.	Fitted For	Height, 44 in. Base to Top Guide.		Height, 45 in. Base to Top Guide.		Height, 47 in. Base to Top Guide.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2¼ inch.	1 inch Pipe.	Bodice	$11.00	. . . . .	. . . .	. . . . .	. . . .
2	2½ "	1¼ " "	Bodiless	11.25	Boggish	$11.75	. . . . .	. . . .
3	2¾ "	1¼ " "	Bodily	11.50	Bogus	12.00	Bollard	$12.50
4	3 "	1¼ " "	Bodkin	12.00	Boiling	12.50	Bolster	13.00
5	3¼ "	1¼ " "	Boggle	12.50	Bolden	13.00	Bolter	13.50
6	3½ "	1½ " "	. . . . .	. . . .	Boldly	13.75	Bolting	14.25
8	4 "	2 " "	. . . . .	. . . .	. . . . .	. . . .	Bombard	16.00

IMPROVED
Anti-Freezing Well Pumps.

FIG. 216—Open-Top.

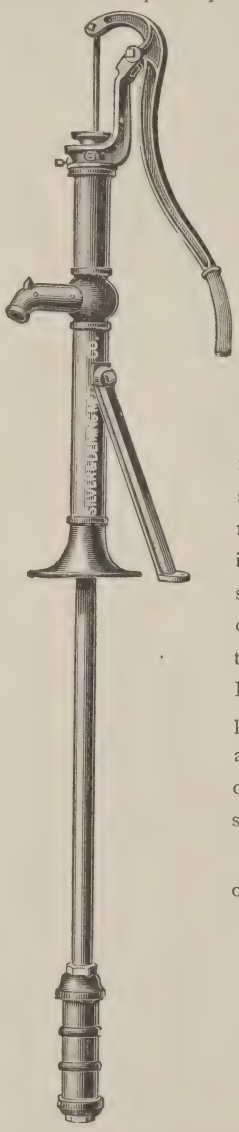


FIG. 217—Tight-Top.

WITH WROUGHT-IRON SET-LENGTH

CONNECTED UNDER SPOUT.

The demand for a light and durable Anti-freezing Pump for use in wells of ordinary depth, and that could be sold at a reasonable price, has induced us to produce **Figs. 216** and **217**, represented by the cuts on this page. They are light in weight, simple and substantial in construction; possessing every feature necessary to make a serviceable Pump. The stock or standard is solid, which allows the pipe connection to be made under the spout, thus preventing liability to damage by frost. The only difference between **Figs. 216** and **217** is in the construction of their tops, the one being an open and the other a tight top Pump; the latter style of top gives a direct vertical motion to the piston-rod and makes it impossible for children to throw stones and sticks into the Pump. These Pumps are adapted for both open and driven wells. Always furnished with raised sand valve seat. Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Fitted For	Fig. 216.		Fig. 217.	
			Cipher.	Price.	Cipher	Price.
1	2¼ inch	1 inch pipe.	Bombast	$7.25	Bondage	$8.00
2	2½ "	1¼ " "	Bombazine	7.50	Bonded	8.25
3	2¾ "	1¼ " "	Bombyx	7.75	Bonding	8.50
4	3 "	1¼ " "	Bonair	8.00	Bondsman	8.75

Fig. 216, Standard, Complete, $5.00. Fig. 217, Standard, Complete, $5.75.

SPECIAL
Anti-Freezing Well Pumps.

FIG. 208—Open-Top.

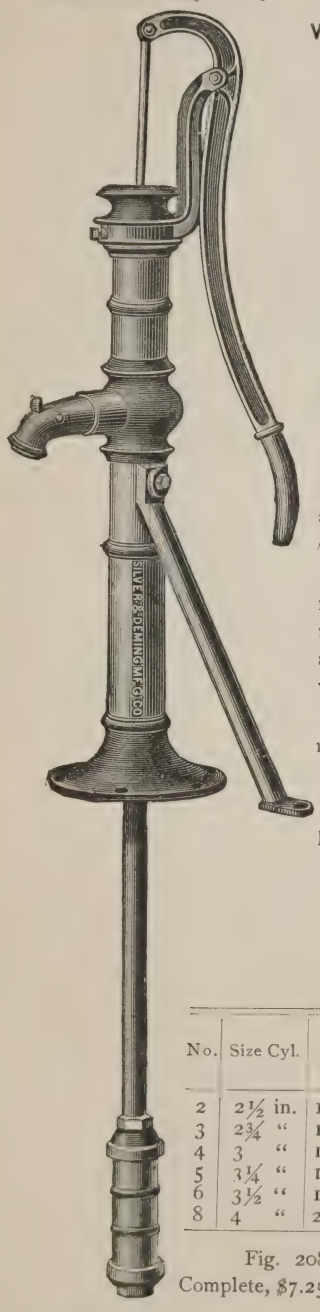


FIG. 209—Tight-Top.

WITH WROUGHT-IRON SET-LENGTH CONNECTED UNDER SPOUT.

The Pumps illustrated herewith, are the same in every part with the exception of their tops; **Fig. 208** having an open, and **Fig. 209** a tight top. The advantage of **Fig. 209** over **208**, is that in the former a direct vertical motion is given to the plunger, which causes it to work smoothly in the cylinder; also, the tight top prevents foreign substances from getting into the working parts of the Pump.

These Pumps have a large, broad base, cast solid to the stock, and the set-length pipe is connected under the spout. They are strong and heavy, and are very desirable for use on driven wells, particularly in cold climates.

The water is delivered to the spout in a few strokes of the lever, and recedes quickly through the drip-hole, which is drilled just above the cylinder. A sand valve seat is provided for the lower valve of cylinder.

Repairs for these Pumps, as for all of our make, will always fit.

Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	Fig. 208.		Fig. 209.	
			Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in. Pipe.	Boneless	$8.75	Booby	$9.50
3	2¾ "	1¼ " "	Boneset	9.00	Bookish	9.75
4	3 "	1¼ " "	Bonfire	9.25	Bookless	10.00
5	3¼ "	1¼ " "	Boniform	9.50	Bookworm	10.25
6	3½ "	1½ " "	Bonnet	10 00	Boomed	10.75
8	4 "	2 " "	Bonny	11.25	Booming	12.00

Fig. 208, Standard, Complete, $6.50. Fig. 209, Standard, Complete, $7.25.

Anti-Freezing Well Force Pumps.

WITH WROUGHT-IRON SET-LENGTH. AIR CHAMBER IN STOCK.

FIG. 219—Solid Base.

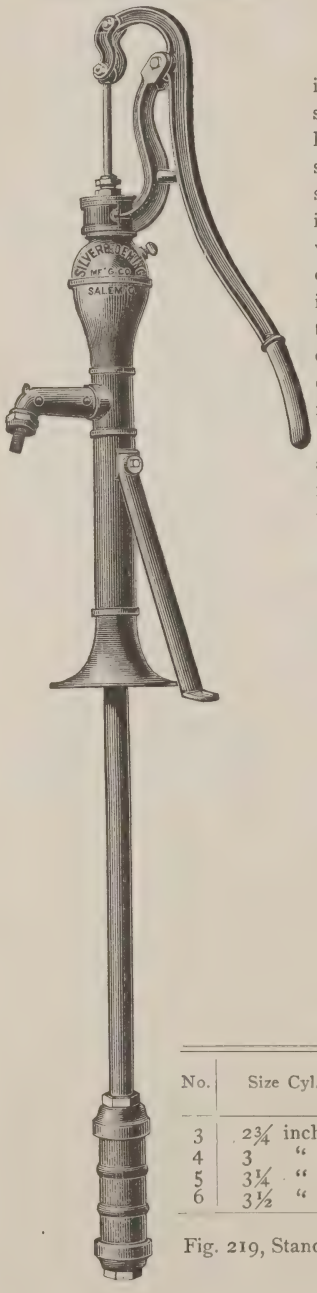
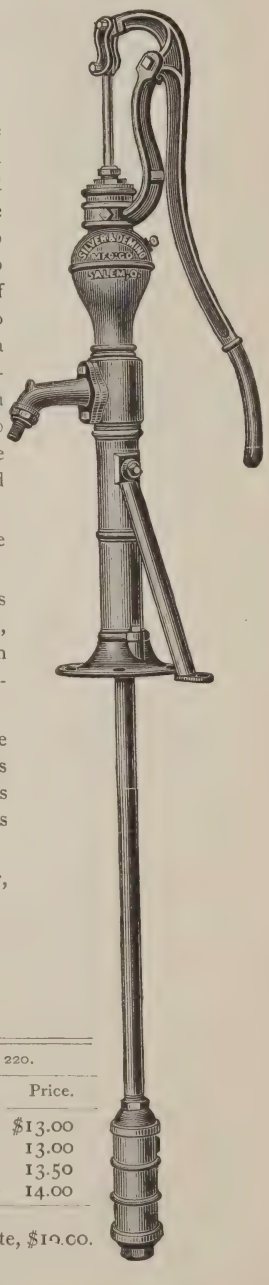


FIG. 220—Bolted Base.



The Force Pumps shown on this page are similar in general construction. They differ, however, in the standard and set-length pipe connection, **Fig. 219** having solid base and standard with spout cast to the stock, while **Fig. 220** has bolted base and bolted spout. The former has the set-length pipe screwed into the stock just under the spout, which delivers the water to the spout quickly and prevents liability to damage by frost. The set-length pipe of **Fig. 220** is attached at the base. The air chamber in each of these Pumps is formed by an enlargement at the top of the stock. The piston-rod in these Pumps has a direct vertical motion, working through a brass stuffing-box. When either **Fig. 219** or **220** is used as a Lift Pump, the thumb-screw should be unscrewed to admit air to the air chamber. When used with hose for forcing water, the thumb-screw should be tightened to confine and compress the air.

Both these Pumps have a hose coupling on the spout.

As listed with three foot set-length, these Pumps are adapted for wells about twenty-eight feet deep, but with the cylinder lowered into, or within fifteen or twenty feet of the water, they will do very satisfactory work in wells fifty to sixty feet deep.

The drip-hole is about three feet below the base of Pump, which allows the water to recede and thus prevents freezing. Repairs for our Pumps will always fit. The length of stroke in **Figs. 219** and **220** is six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	Fig. 219.		Fig. 220.	
			Cipher.	Price.	Cipher.	Price.
3	2¾ inch.	1¼ inch Pipe.	Boorish	$12.50	Booty	$13.00
4	3 "	1¼ " "	Booser	12.50	Bopeep	13.00
5	3¼ "	1¼ " "	Boozy	13.00	Boracic	13.50
6	3½ "	1½ " "	Booting	13.50	Borax	14.00

Fig. 219, Standard, Complete, $9.00. Fig. 220, Standard, Complete, $10.00.

Anti-Freezing Well Force Pumps.

WITH WROUGHT-IRON SET-LENGTH. AIR CHAMBER ON SPOUT.

FIG. 223—Solid Base.

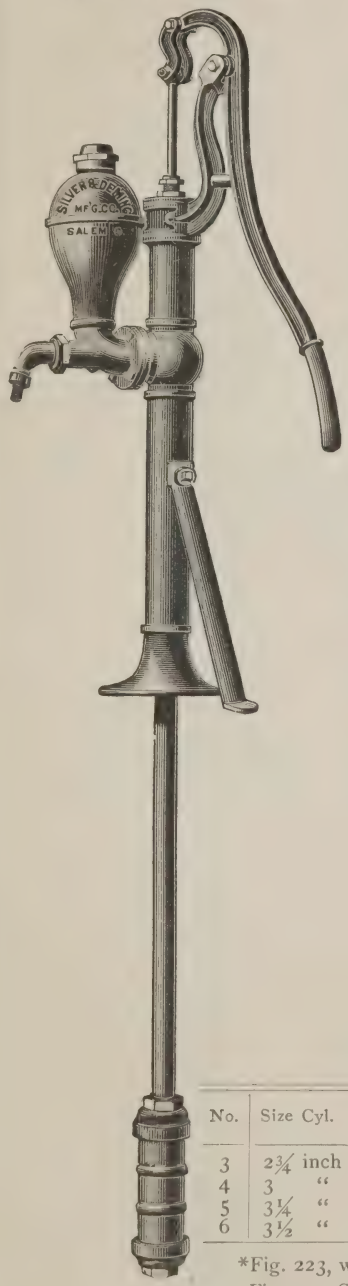
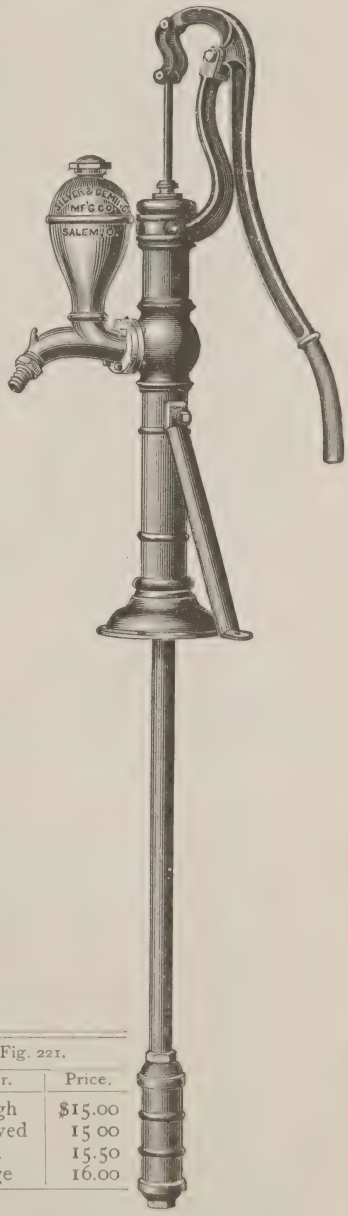


FIG. 221—Screwed Base.



The Pumps illustrated on this page are similar in most respects. They differ principally in the construction of the stock or standard; **Fig. 223** having the stock and base cast solid together, with set-length pipe screwed into the stock under the spout; while the base of **Fig. 221** is screwed to the stock, and set-length pipe is attached at the base. These Pumps have gained great popularity for use about gardens, yards and stables, and when located near the house are quite efficient for protection against fire. A spout hose coupling is attached to each of these Pumps. When used as a lift Pump only, the cap on air chamber should be unscrewed. As listed these Pumps are adapted to wells about twenty-eight feet deep, but when the cylinder is lowered to from fifteen to twenty feet above the water, they may be used to advantage in wells from sixty to seventy feet deep. To prevent freezing, the drip-hole is made in pipe about three feet below base of Pump. Repairs for our Pumps will always fit.

Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	*Fig. 223.		Fig. 221.	
			Cipher.	Price.	Cipher.	Price.
3	2¾ inch	1¼ in. Pipe	Border	$14 00	Borough	$15.00
4	3 "	1¼ "	Borderer	14.00	Borrowed	15.00
5	3¼ "	1¼ "	Bordman	14.50	Bosom	15.50
6	3½ "	1½ "	Boreal	15.00	Bossage	16.00

*Fig. 223, with cock on spout, $2.50, extra list.

Fig. 223, Standard, Complete, $10.00. Fig. 221, Standard, Complete, $11.00.

Anti-Freezing Well Force Pumps.

WITH WIND-MILL TOP.

WROUGHT-IRON SET-LENGTH CONNECTED UNDER SPOUT.

FIG. 422—Plain Spout.

FIG. 442—Cock Spout.

The Force Pumps illustrated on this page, are the same as **Fig. 413** and **Fig. 417**, with the addition of a set-length pipe and cylinder. The wind-mill top gives a direct vertical motion to the plunger, thus wearing the cylinder evenly and smoothly, on which account these Pumps are often preferred to Set-length Pumps with the ordinary tops. These Pumps are provided with a brass hose coupling, and back outlet, also with brass stuffing box and brass thumb screw in the air chamber. When used as Lift Pumps, the brass thumb screw should be loosened. The set-length pipe in these Pumps is connected under the spout, which prevents liability to damage by frost, and makes them very desirable for cold climates. These Pumps have the usual drip-hole to allow the water to escape after pumping.

Fig. 442 having cock spout and back outlet, is very desirable as a tank Pump, as the water can be either discharged at the spout or forced into a tank.

Wind-mill Slides are not furnished with these Pumps unless especially ordered.

Length of stroke, six inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Fitted For	Fig. 422.		Fig. 442.	
			Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in. Pipe.	Botanic	$13.00	Bothnian	$15.50
3	2¾ "	1¼ " "	Botanist	13.00	Bottled	15.50
4	3 "	1¼ " "	Botanize	13.50	Bottling	16.00
5	3¼ "	1¼ " "	Botargo	14.00	Bottom	16.50
6	3½ "	1½ " "	Bothnic	14.50	Bouillon	17.00

Southern Cistern and Well Pumps.

WITH WORKING BARREL IN THE STOCK.

FIG. 225—Lift Pump.

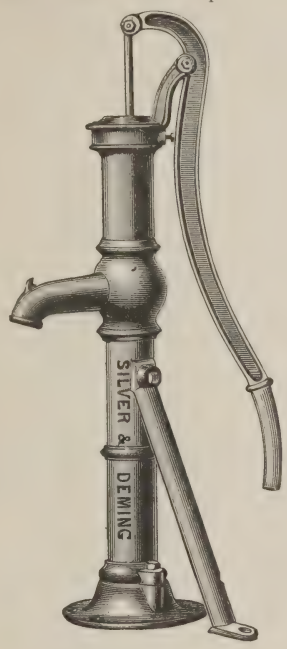
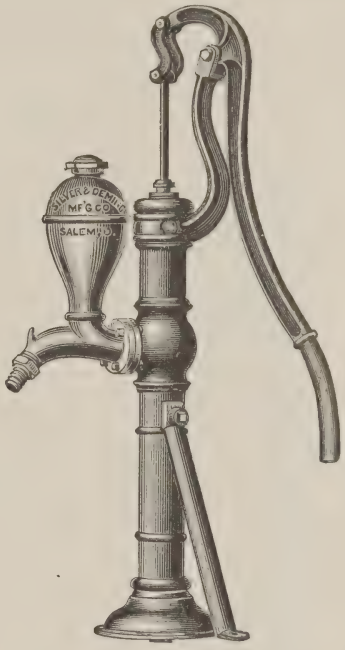


FIG. 226—Force Pump.



The Pumps herewith illustrated are adapted for cistern use in cold climates; and in warm climates they may be used also in shallow wells, where the base of Pump can be located not over twenty-five feet above the surface of the water.

The working barrel is in the stock of Pump, and, in this respect, these Pumps are similar to **Figs. 121, 123,** etc The stocks or standards, however, are much taller, and in every way they are substantially constructed.

The working barrels of these Pumps are bored true and highly polished. To prevent freezing, raise the lever to its extreme height. The lever or handle may be placed in any position for pumping, the same as our Set-length and Cistern Pumps. Length of stroke, six inches.

Fig. 226 is provided with coupling on the spout for attaching one-inch hose.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Fitted For	Fig. 225.		*Fig. 226.	
			Cipher.	Price.	Cipher.	Price.
4	3 inch.	1¼ inch Pipe.	Bouncer	$8.50	Boundary	$13.00
5	3¼ "	1¼ " "	Bouncing	9.00	Bounder	14.00

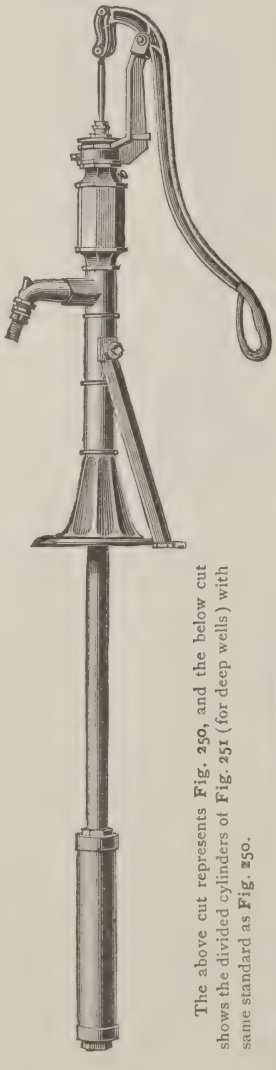
THE "PEERLESS"

Double-Acting Force Pump.

(PATENTED.)

FOR SHALLOW AND DEEP WELLS.

FIG. 250.



The above cut represents **Fig. 250**, and the below cut shows the divided cylinders of **Fig. 251** (for deep wells) with same standard as **Fig. 250.**

FIGS. 250 and 251.

In the construction of the "Peerless" Double-Acting Force Pump we have combined the good qualities of the Standard style of Well Force Pump with the particular features of a Double-Acting Pump. It works with great ease, *discharges a continuous stream of water*, and *dispenses with the stuffing-box.*

In **Fig. 250,** *the Shallow Well Pump*, the two cylinders (one above the other) are contained in the same cylinder shell. In **Fig. 251,** *the Deep Well Pump*, the cylinders are divided.

The "PEERLESS" PUMP is *handsome in design* and *substantial in construction;* it is *anti-freezing* and can be used in a cistern, or well of any kind. A hose coupling is attached to the spout, making it valuable as a Fire Pump, and for use about *stables, gardens, greenhouses, etc.* Always furnished with brass valve seats. **Fig. 250** is adapted for wells thirty feet deep; it has brass-tube upper cylinder, and brass-lined lower cylinder. **Fig. 251** is adapted for wells up to 100 feet deep, and is always furnished with brass-tube lower cylinder, with inside attachments, unless otherwise ordered. **Fig. 251, No. 2,** can be used in three inch drilled wells.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

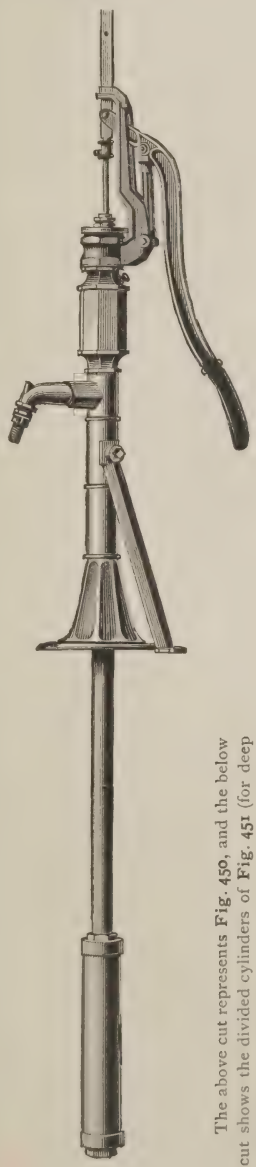
No.	Size Cyl.	Fitted For.	Stroke.	Fig. 250. For Shallow Wells.		Fig. 251. For Deep Wells.	
				Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in. Pipe.	6 in.	. . . . .	. . . .	Bouquet	$17.00
4	3 "	1¼ " "	6 "	Bountiful	$15.00	Bourbon	19.00
6	3½ "	1½ " "	6 "	Bounty	17.00	. . . . .	. . . .

THE "PEERLESS"

Double-Acting Force Pump.

WITH WIND-MILL TOP.

FIG. 450.



The above cut represents **Fig. 450**, and the below cut shows the divided cylinders of **Fig. 451** (for deep wells) with same standard as **Fig. 450.**

FOR SHALLOW AND DEEP WELLS.

FIGS. 450 and 451.

The annexed cuts represent the "Peerless" Double-Acting Force Pumps, **Figs. 450 and 451,** with wind-mill top. In all respects, except the top, these Pumps are the same as **Figs. 250 and 251,** illustrated and described on preceding page; they are adapted for the same purposes, and have the additional advantage of the wind-mill top, to which, if desired, the attachment may be made to a Wind Mill.

A suction pipe strainer and hose coupling are furnished with every "Peerless" Pump, **Figs. 250, 251, 450, and 451.** These pumps are always furnished with brass valve seats.

Fig. 450 is adapted for wells thirty feet deep; **Fig. 451** is adapted for wells up to 100 feet deep, and is always furnished with brass-tube lower cylinder with inside attachments, unless ordered with brass-lined cylinder. **Fig. 451,** No. 2, can be used in three inch drilled wells.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

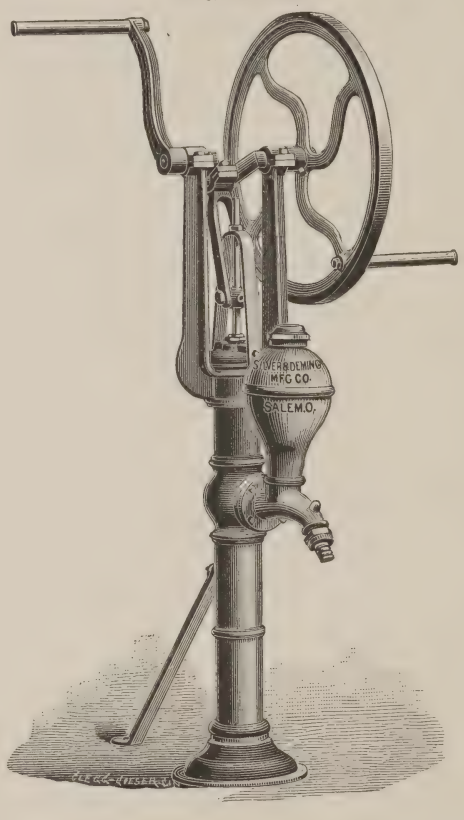
Sizes and Prices.

No.	Size Cyl.	Fitted For	Stroke.	Fig. 450. For Shallow Wells.		Fig. 451. For Deep Wells.	
				Cipher.	Price.	Cipher.	Price.
2	2½ in.	1¼ in. Pipe.	6 inch.	. . . . .	. . .	Bovine	$18.00
4	3 "	1¼ " "	6 "	Bourgeois	$16.00	Bowlder	20.00
6	3½ "	1½ " "	6 "	Bournless	18.00	. . . .	. . . .

Southern Well Force Pump.

WITH FLY-WHEEL AND CRANKS.

FIG. 275.



This Pump is the same as **Fig. 226**, with fly-wheel and two cranks, an arrangement which adapts it to be worked by either one or two men.

Fig. 275 is a very desirable Pump for fire protection, as well as for general use about the house or garden.

When so ordered, we can furnish this Pump (standard and top) for use in deep wells (without the plunger and lower valve) in connection with our independent cylinders, listed on pages 78 to 81.

As listed below, **Fig. 275** is adapted for wells about twenty-five feet deep.

Repairs for this Pump, as for all others of our make, will always fit.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Fitted For	Length of Stroke.	Cipher.	Price.
4	3 inch.	1¼ inch Pipe.	6 inches.	Bounding	$30.00
5	3¼ "	1¼ " "	6 "	Bounteous	33.00

Standard less plunger and valves for deep wells, same list price.

IMPROVED

Lift Pump Standards.

PIPE CONNECTION UNDER SPOUT.

FIG. 224—Open-Top.

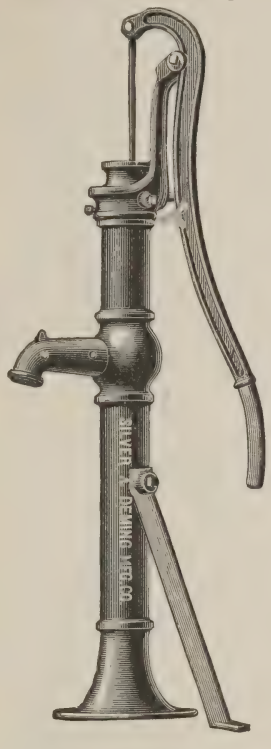


FIG. 228—Tight-Top.

The illustrations above, **Figs. 224** and **228**, represent Well Pump Standards, suitable for wells from thirty to seventy feet deep—the larger sizes, Nos. 4 and 5, being best adapted for the deeper wells. These standards have solid base and are threaded for pipe under the spout; they are the same as standards complete of **Figs. 210, 211** and **212**; and **213, 214,** and **215.**

To prevent freezing a small drip-hole should be drilled in pipe about three feet below base of the Pump. Our independent cylinders or working barrels, **Figs. 300, 302, 303, 308, 309,** or **312,** listed on pages 78 to 81, may be used with these standards.

These Pump Standards are deserving of an extensive sale. They are, in themselves, a complete line of Lift Standards for wells up to seventy feet deep.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	*Fitted For	Length of Stroke.	Fig. 224.			Fig. 228.		
			Height.	Cipher	Price.	Height.	Cipher.	Price.
3	1¼ in. pipe.	6 inches.	44 inches	Bracelet	$5.50	47 inches	Braggart	$6.25
4	1¼ "	6 "	45 "	Bracing	6.00	48 "	Braided	6.75
5	1½ "	6 "	47 "	Brackish	6.50	50 "	Braiding	7.25

*Fitted for other sizes of Pipe, when so ordered.

IMPROVED

Force Pump Standards.

PIPE CONNECTION UNDER SPOUT.

FIG. 239.

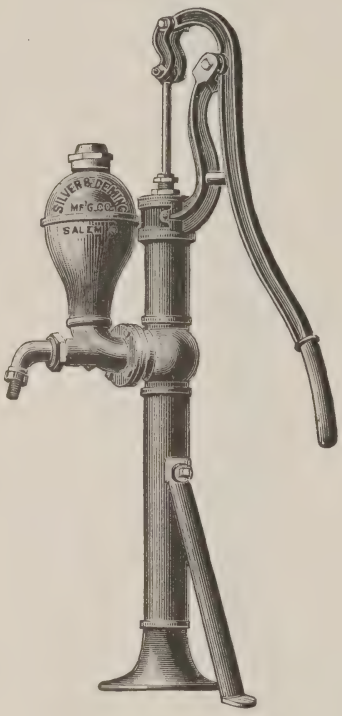


FIG. 229.

The above cuts show our Well Force Pump Standards with solid base, **Figs. 229** and **239**, which are the same as standards complete of **Figs. 219** and **223** respectively. These standards are used in connection with cylinders, **Figs. 300, 302, 303, 308, 309,** or **312,** listed on pages 78 to 81, and are adapted for wells from thirty to seventy feet deep. The solid base with pipe connection under spout makes these Pumps less liable to freeze than if constructed with bolted base and pipe connection at the base. To prevent freezing, the pipe should be provided with a drip-hole three feet below the base to allow the water to run back after pumping.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

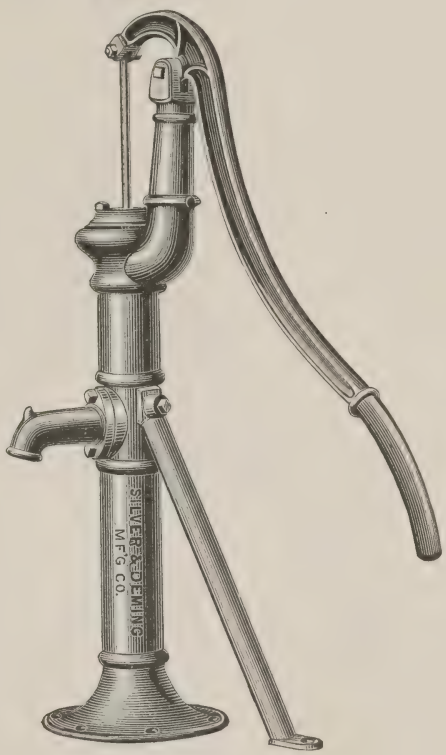
Standard Complete.	*Fitted For.	Length of Stroke.	Fig. 229.			Fig. 239.		
			Height.	Cipher.	Price.	Height.	Cipher.	Price.
	1¼ in. pipe.	6 inches.	48½ in.	Brained	$9.00	49 in.	Brainless	$10.00

*Fitted for other sizes of Pipe, when so ordered.

Special Well Pump Standard.

PIPE CONNECTION UNDER SPOUT.

FIG. 227.



The above cut represents our Well Pump Standard, **Fig. 227**, which can be effectively used in wells up to seventy-five feet in depth. We do not consider this style of Pump a Shallow Well Pump, notwithstanding it has been generally known to the trade as such.

This Pump is substantially constructed, has a strong brace, and a long, heavy lever. The suction pipe is screwed into the stock just below the spout, which lessens liability to damage by frost. The cylinders adapted for this Standard are **Figs. 302, 304, 305, 309, 310,** and **312,** listed on pages 78 to 81.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Size and Price.

Fig. 227.	* Fitted For	Stroke.	Height.	Cipher.	Price.
Standard Complete.	1¼ inch Pipe.	8 inches.	43 inches.	Brakeman	$6.00

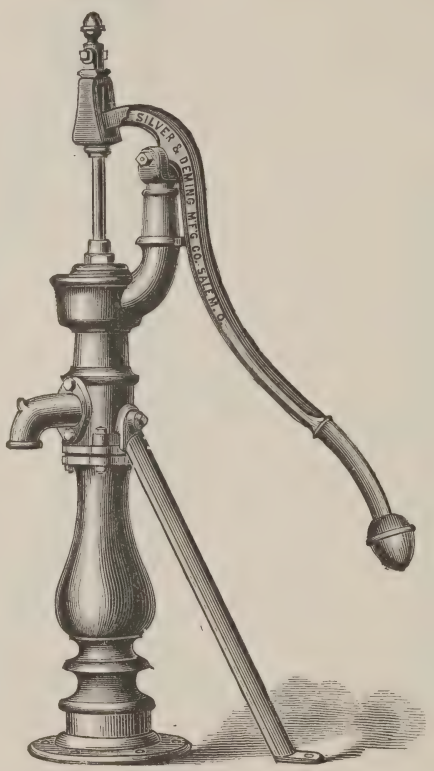
*Fitted for 1, 1½, or 2 inch pipe when so ordered.

IMPROVED

Deep Well Pump Standard.

WITH TIGHT-TOP ROD GUIDE.

FIG. 230.



The cut on this page represents a style of Deep Well Pump Standard that is favorably known in various sections of the United States. In localities where the wells are necessarily from 50 to 150 feet deep, this is considered the Standard Pump. When used for open wells, **Fig. 302, 304, 310 or 312** cylinder should be used, and in drilled wells, **Fig. 305** or **312** (14 or 16 inches long, with inside attachments) should be used in connection with **Fig. 230** Standard. These cylinders are listed on pages 78 to 81.

This Pump is made in two sections with pipe flange bolted between, which makes it convenient for setting in a deep well.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Size and Price.

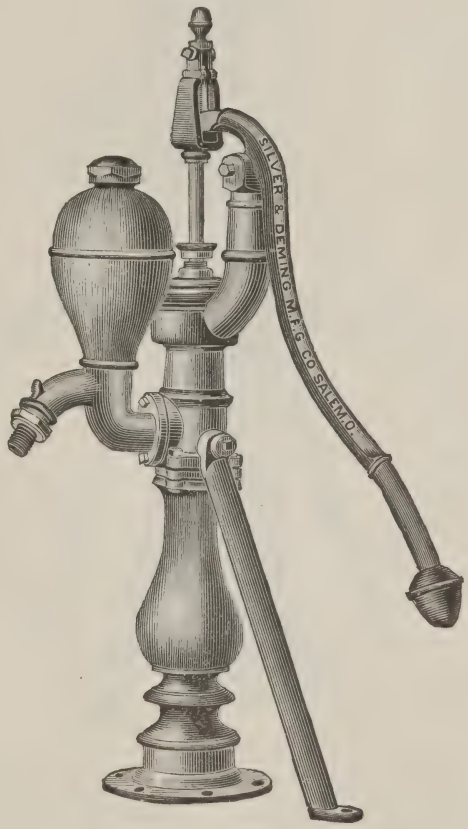
Fig. 230.	*Fitted For	Stroke.	Height.	Cipher.	Price.
Standard Complete.	1¼ in. Pipe.	7 inches.	51½ inches.	Bramble	$10.00

*Fitted for 1½, 2, or 2½ inch pipe, when so ordered. Extra pipe flanges, 50 cents each.

IMPROVED
Deep Well Force Pump Standard.

WITH AIR CHAMBER ON SPOUT.

FIG. 231.



This Pump is constructed in the same way as **Fig. 230** on the preceding page, with the addition of an Air Chamber and a Stuffing-box, which are necessary to make it a Force Pump. **Fig. 231** may be used in any well to which **Fig. 230** is adapted. These Pumps are so well known as to need no particular description. They are used in connection with Cylinders, **Figs. 302, 304, 305, 309, 310, 312, and 322.** These Cylinders are listed on pages 78 to 81. As in other well Pumps, a drip-hole to prevent freezing should be drilled in the pipe three or four feet below the base of Pump.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Size and Price.

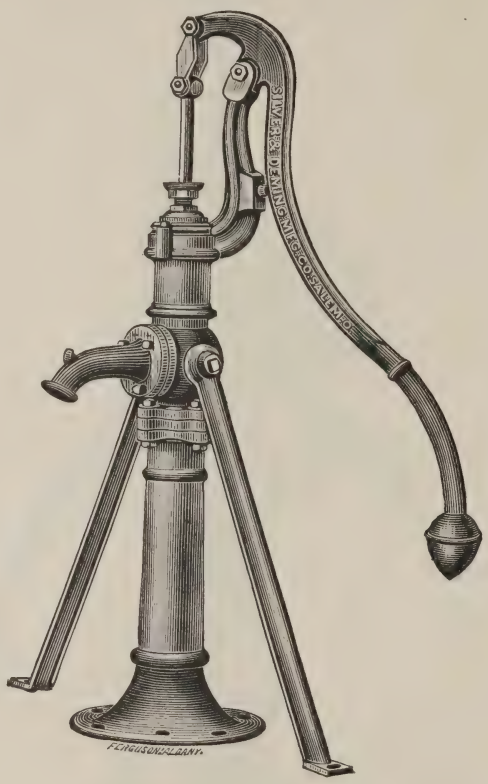
Fig. 231.	* Fitted For	Stroke.	Height.	Cipher.	Price.
Standard Complete.	1¼ inch pipe.	7 inches.	51½ inches.	Branched	$13.00

*Fitted for 1½, 2, or 2½ inch pipe, when so ordered. Extra Pipe Flanges, 50 cents each.

Deep Well Lift Pump Standard.

EXTRA HEAVY.

FIG. 232.



The above illustration represents our Extra Heavy Lift Pump Standard for very deep wells. It differs from **Fig. 230** in that it is much heavier, has two braces for support, and a revolving top so the lever can be placed in any position required. The suction pipe, as in **Fig. 230**, screws into a flange between the bottom and top sections. The lever is long and is balanced to facilitate pumping when used in deep wells. This is a very desirable Pump for use in public places where constant and rough handling may be anticipated. As a Town Pump and for use in parks, schoolhouse yards, etc., it has no equal. To make anti-freezing, drill a small hole in suction pipe about three feet below the base. Our Deep Well Cylinders, **Figs. 304, 305, 310, 312 and 322,** are adapted to this Standard. Cylinders will be found on pages 78 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Size and Price.

Fig. 232.	* Fitted For	Stroke.	Height.	Cipher.	Price.
Standard Complete.	1½ inch pipe.	7 inches.	55 inches.	Branching	$16.00

* Fitted for 1¼, 2, or 2½ inch pipe, when so ordered. Extra Pipe Flanges, 50 cents each.

Deep Well Force Pump Standard.

EXTRA HEAVY.

FIG. 233.

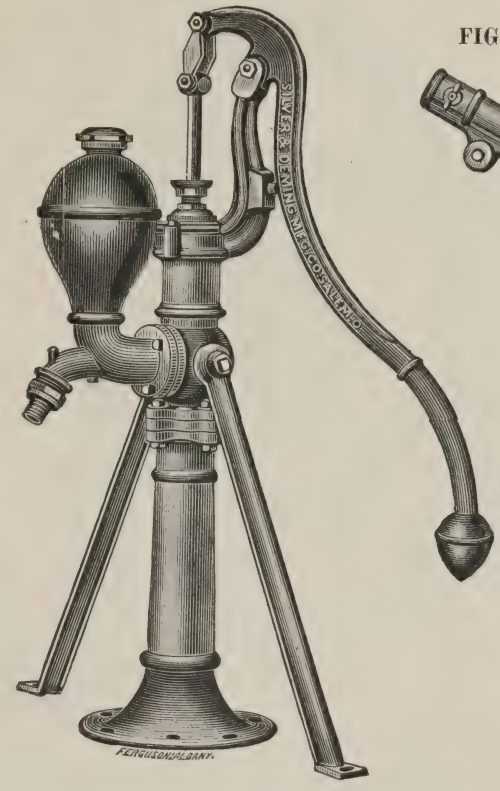


FIG. 234. BRAKE.

Fig. 233 is similar to **Fig. 232**, except that it has the Air Chamber and Stuffing-box necessary to make it a Force Pump. It may also be arranged with Brake and Wood Levers (**Fig. 234**) so that two or more men can operate it for fire protection or other purposes where a constant stream of water is desired. Cylinders, **Figs. 304, 305, 310, 312, and 322,** are adapted to this Pump Standard, same as to **Fig. 232.** To make anti-freezing, drill a small hole in suction pipe about three feet below the base. With Brake and Wood Levers it is designated as **Fig. 234.** Cylinders will be found on pages 78 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Standard Complete.	* Fitted For	Stroke.	Height.	Fig. 233.		† Fig. 234.	
				Cipher.	Price.	Cipher.	Price.
	1½ inch pipe.	7 inches.	55 inches.	Branchless	$20.00	Brandied	$21.00.

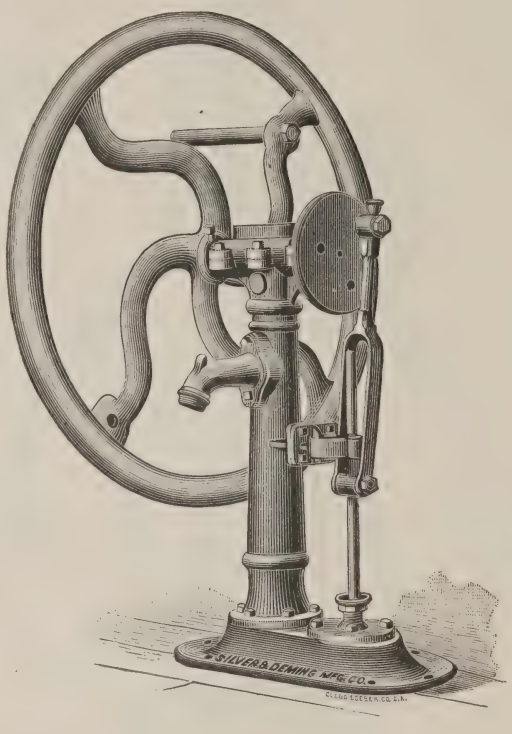
*Fitted for 1¼, 2, or 2½ inch pipe, when so ordered. Extra Pipe Flanges, 50 cents each.

†**Fig. 234** is the same as **Fig. 233,** substituting the Brake and Wood Levers for the Handle.

Deep Well Force Pump Standard.

WITH CRANK FLY-WHEEL. FOR HAND USE.

FIG. 584.



The above cut represents a Deep Well Force Pump Standard, arranged with Crank Fly-wheel, and Pitman with Rod Guide. The Stuffing-box is in the base; to this also the Standard is securely bolted.

At the top of Standard is the crank shaft journal, on one side being the crank fly-wheel, and on the other the face-plate and pitman.

When used for forcing water a distance the spout is replaced by a flange, threaded for the discharge pipe.

The Cylinders to be used in connection with **Fig. 584**, are **Figs. 302, 303, 304, 305, 309, 310, 312, and 322.** Description and lists of Cylinders, on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	*Fitted For	Stroke.	Fly-Wheel.	Discharge.	Cipher.	Price.
1	1½ inch pipe.	6 inches.	36 inches.	Plain Spout or Flange.	Brasier	$39.00
2	1½ " "	6 "	36 x 4½ in.	" " "	Brassy	41.00

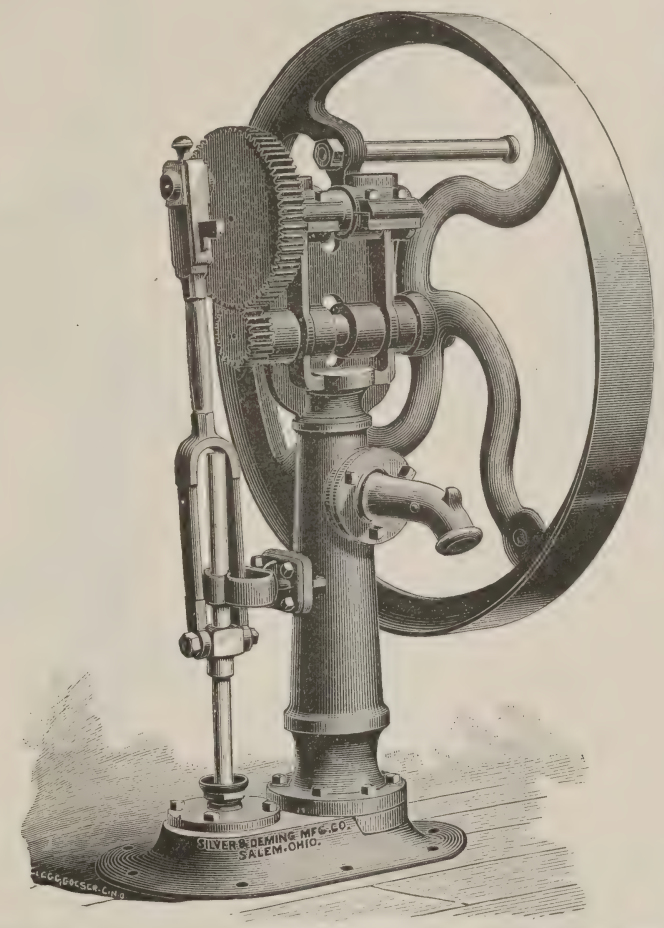
*Fitted for 1¼, 1½, or 2 inch pipe, but always for 1½ inch, unless otherwise ordered. Nos. 1 and 2 always fitted with Plain Spout unless Flange is especially ordered. Flange threaded same as suction, unless otherwise ordered.

N. B. No. 2 is same as No. 1 with Pulley Fly-wheel for power, similar to **Fig. 586**, on next page.

Deep Well Force Pump Standard.

WITH GEARING AND PULLEY FLY-WHEEL.

FIG. 586.



The Pump Standard illustrated herewith is adapted to elevating water from very deep wells and to a great height, by either hand or power. The Fly-wheel is made heavy and broad so that a belt can be attached for running by power, and a handle is also connected for operating by hand. The gearing is arranged to increase the power three to one. In elevating water, or conveying to a great distance, a Pipe Flange is used, and is furnished instead of the spout when ordered. The Cylinders to be used in connection with this Standard, are **Figs. 304, 305, 310, 312, and 322,** on pages 79 to 81.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	*Fitted For	Stroke.	Pulley Fly-Wheel.	Discharge.	Cipher.	Price.
1	1½ inch pipe.	7 inches.	36 × 4½ inches.	Plain Spout or Flange.	Bravado	$ 65.00
2	1½ " "	7 "	36 × 4½ "	With Air Chamber.	Bravely	68.00
3	1½ " "	7 "	36 × 4½ "	Air Chamber and Cock.	Braving	70.00

*Fitted for 1¼, 1½, or 2 inch pipe, but always for 1½ inch, unless otherwise ordered.

N. B. Nos. 2 and 3 are the same as No. 1, except that No. 2 has Air Chamber, and No. 3 Air Chamber and Cock on Spout. The cut shows No. 1 with Spout. No. 1 is always furnished with Spout unless ordered with Flange.

Wind Mill Pump Heads.

FIG. 397.—Wood Pump Top.

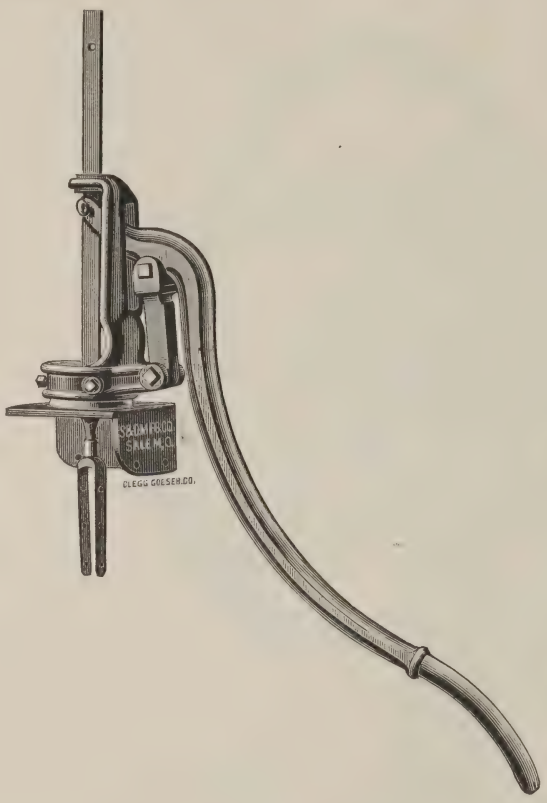
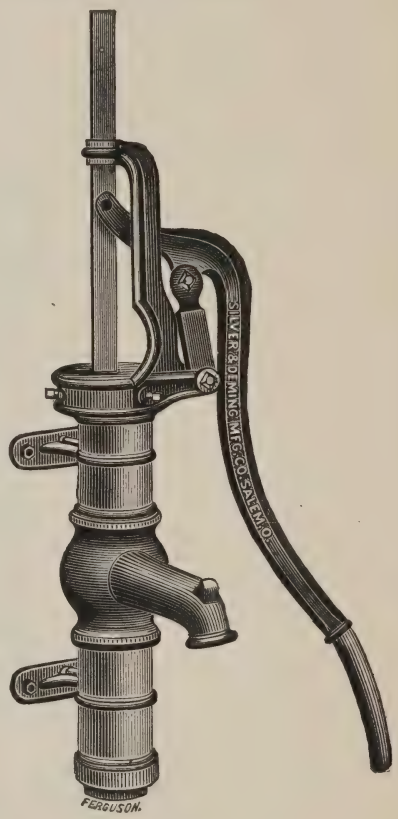


FIG. 399.—With Brackets.



The above cuts represent different styles of Wind Mill Pump Heads. **Fig. 397** is adapted for attaching to the top of Wood Pump for the convenience of persons who already have a well with Wood Pump and wish to place a Wind Mill over it. **Fig. 397** is provided with Forked Coupling for attaching to Wood Rod.

Fig. 399 (as well as **Fig. 397**) is adapted for either hand or Wind Mill use. It can be fastened to a wall or post in places where an ordinary Wind Mill Pump Standard could not be located. We recommend Brass Tube Cylinders, **Figs. 312** and **322**, for use with **Fig. 399**. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

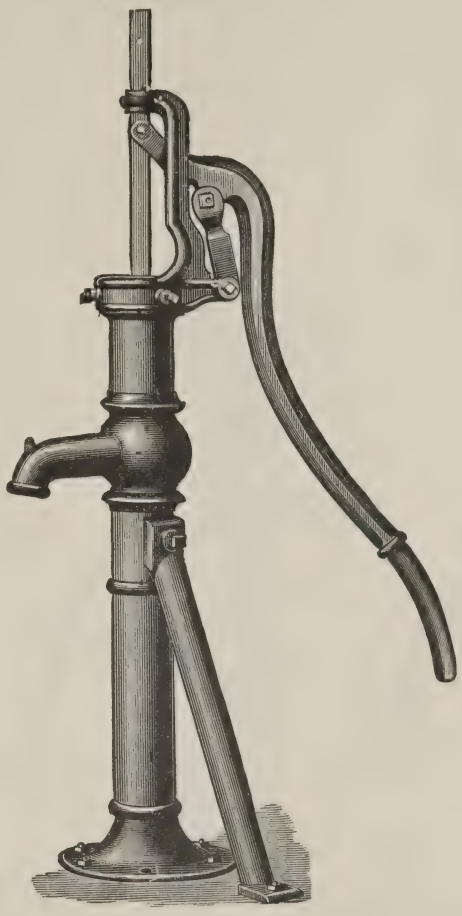
Sizes and Prices.

Fig.	* Fitted For	Stroke.	Cipher.	Price.
397	Wood Pump Top.	6 inches.	Dabbed	$ 5.00
399	1¼ inch pipe.	6 "	Dabble	5.50

* **Fig. 399** is fitted for 1, 1¼, or 1½ inch pipe, but always for 1¼ inch, unless otherwise ordered.

Wind Mill Lift Pump Standard.

FIG. 400.



The above illustration represents accurately our **Fig. 400**, a Wind Mill Lift Pump Standard, that has been long and favorably known to the trade. We make two sizes of this Standard, Nos. 4 and 5, and the latter is furnished with either six or ten inch stroke.

The pipe is screwed to the Standard under the spout, which lessens the liability to damage by frost. In the suction pipe a small vent or drip-hole should be made about three feet below the base to allow the water to flow back after pumping. Brass Tube Cylinders, **Figs. 312** and **322**, are best adapted for use in connection with these Standards.

Description and lists of Cylinders on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

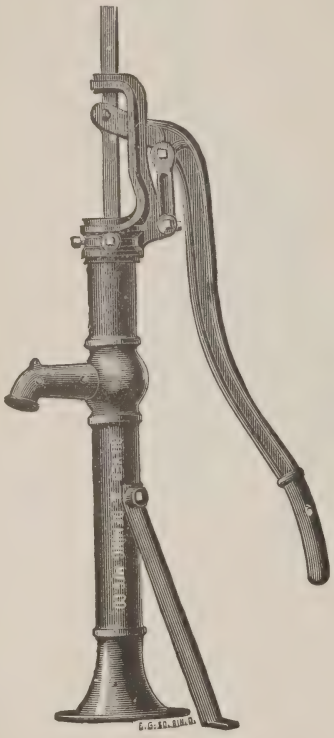
No.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	*Fitted For	Height.	Cipher.	Price.	*Fitted For	Height.	Cipher.	Price.
4	1¼ in. pipe.	44 inches.	Dactyl	$7.00	. . . . .	. . . . .	. . . . .	. . . .
5	1¼ " "	46 "	Daffodil	8.00	2 in. Pipe.	50 inches.	Dagger	$9.50

*Fitted for 1, 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. These Standards furnished with Forked Rod Coupling, when fitted for 2 inch pipe for Tubular Wells.

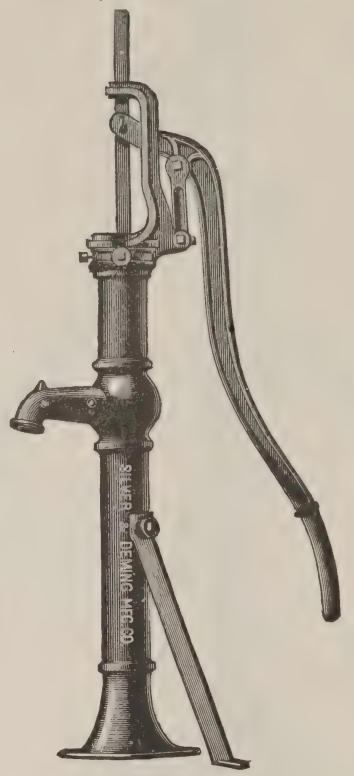
Wind Mill Lift Pump Standards.

FIG. 403.

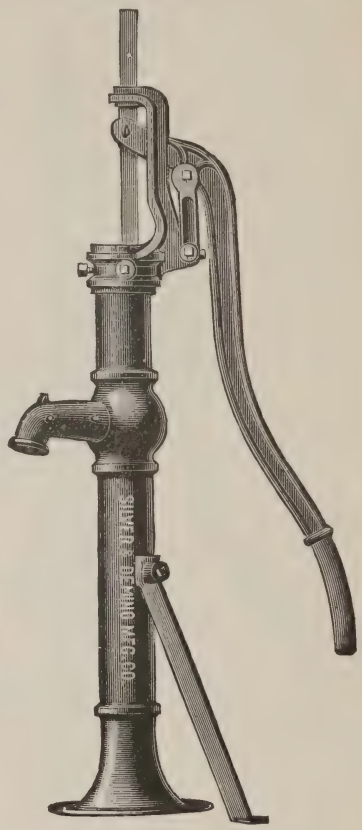
No. 3.—Light.



No. 4.—Medium.



No. 5.—Heavy.



The above Pump Standards, as may be seen, are adapted to either hand or Wind Mill purposes. We have combined in these Standards every good quality necessary to make a perfect Pump. They are strong and substantial, and symmetrical in design. They are made, as are all of our Wind Mill Pumps, with close top, so the Piston-rod always works in line with the Plunger. The pipe screws into the stock under the spout, which prevents liability to serious damage by frost. A drip-hole should be drilled in the suction pipe about three feet below the base. We recommend particularly **Figs. 312** and **322** Brass Tube Cylinders to be used in connection with these Standards. Cylinders or Working Barrels are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

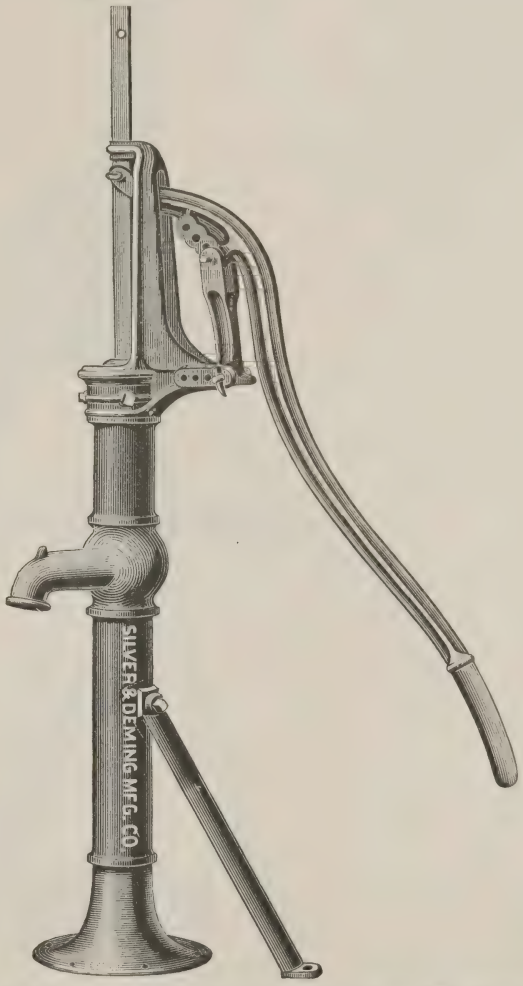
No.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	*Fitted For	Height.	Cipher.	Price.	*Fitted For	Height.	Cipher.	Price.
3	1¼ inch pipe.	44 inches.	Dahlia	$ 7.00	. . . . .	. . . . .	. . . . .	. . . . .
4	1¼ " "	45 "	Dainty	7.50	2 inch pipe.	49 inches.	Damnable	$ 9.00
5	1¼ " "	47 "	Damask	8.00	2 " "	51 "	Damnation	9.50

*Fitted for 1, 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. Furnished with Forked Rod Coupling when fitted for 2 inch pipe for Tubular Wells.

Wind Mill Lift Pump Standard.

WITH ADJUSTABLE STROKE.

FIG. 419.



The cut on this page represents a Wind Mill Pump Standard with Adjustable Stroke. The Standard is the same as **Fig. 403**; Nos. 4 and 5 corresponding with the sizes by these numbers in **Fig. 419**. The stroke is adjustable from six to seven, eight, and ten inches in length by changing the position of the two pins connecting the fulcrum and link with the lever. This Pump is always fitted for two inch pipe with Forked Rod Coupling for Tubular Wells, unless otherwise ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

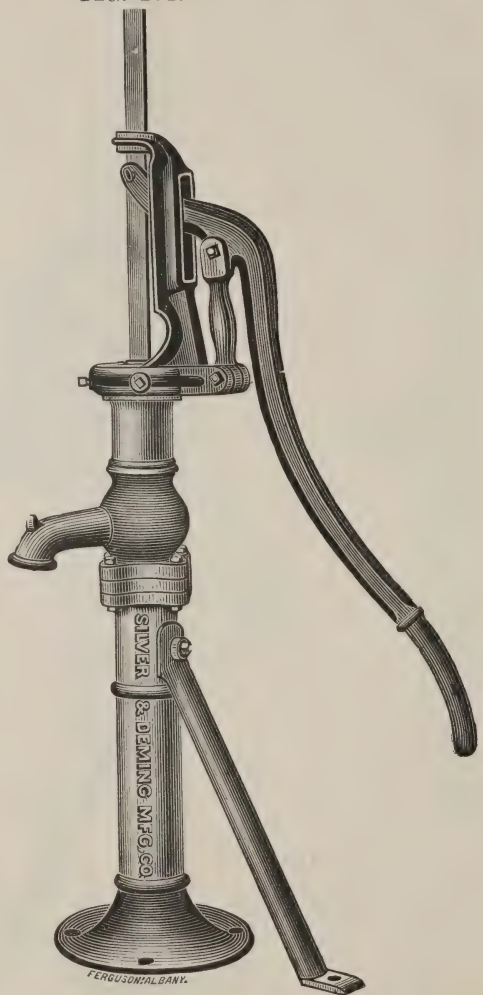
No.	*Fitted For	Height.	Stroke.	Cipher.	Price.
4	2 inch pipe.	49 inches.	6, 7, 8, and 10 in.	Damper	$ 9.50
5	2 " "	51 "	6. 7, 8, and 10 in.	Dampish	10.00

*Fitted for 1, 1¼, 1½, or 2 inch pipe, but always for 2 inch, unless otherwise ordered. For Tubular Wells, Cylinders and Valves on pages 86 and 87 may be used. **Figs. 312** and **322**, on page 81, are best adapted for this Standard in open or drilled wells.

Wind Mill Lift Pump Standard.

FOR TUBULAR AND DEEP WELLS.

FIG. 401.



This Pump Standard is made in two sections with flange between threaded for Iron Pipe, from 1¼ inch to 2½ inch, as ordered. Being made in this way, **Fig. 401** can be handled with facility in placing it on Tubular and other deep wells; the bottom section can be set, the flange attached to the pipe, and then the top section bolted on. It can be used for any kind of Deep Well, the same as our regular Deep Well Pump Standards. We recommend **Figs. 312** and **322** Brass Tube Cylinders, for use with **Fig. 401**, in Open or Drilled Wells. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 401.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
Standard Complete.	1¼ inch pipe.	46 inches.	Damson	$ 10 00	2 inch pipe.	50 inches.	Dancer	$ 11.50

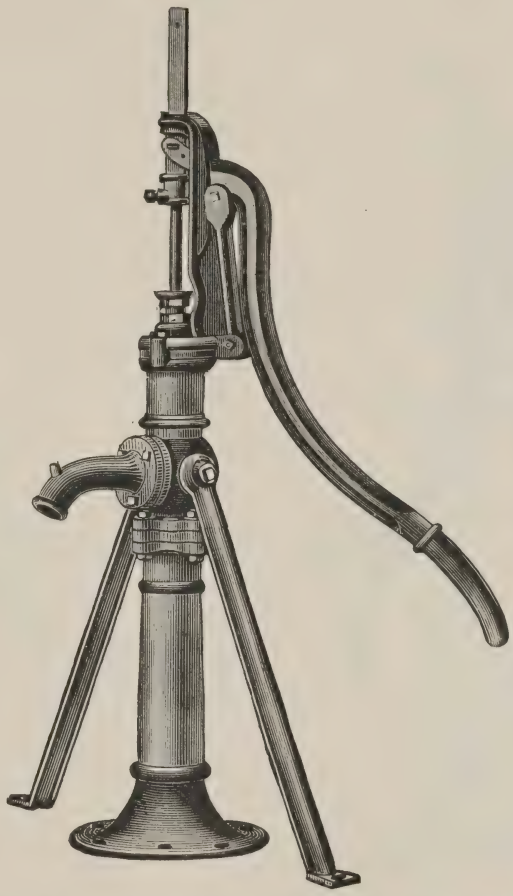
*Fitted for 1¼, 1½, 2, or 2½ inch pipe, but always as listed, unless otherwise ordered. This Standard with 10 inch stroke for 2 inch pipe furnished with Forked Wood-rod Coupling for Tubular Wells. Extra Pipe Flanges, 50 cents each.

EXTRA HEAVY

Deep Well Lift Pump Standard.

WITH WIND-MILL TOP.

FIG. 426.



The above cut represents our Deep Well Lift Pump Standard, **Fig. 426**, with Wind-mill Top. It is the same in construction as **Fig. 232**, with the exception of the Top, and may be worked either by hand or by Wind-mill power. These Pumps may be used in wells over 200 feet deep, their construction adapting them for the deepest wells.

The same Cylinders are adapted for **Fig. 426** as for **Figs. 232** and **233**; viz.: **Figs. 304, 305, 310, 312** and **322.** Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 426.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	*Fitted For	Height.	Cipher.	Price.	*Fitted For	Height.	Cipher.	Price.
Standard Complete.	1½ inch pipe.	55 inches.	Deadish	$17.00	2 inch pipe.	59 inches.	Deafen	$18.50

* Fitted for 1¼, 1½, 2, or 2½ inch pipe, but always as listed, unless otherwise ordered. Extra Pipe Flanges, 50 cents each.

SPECIAL
Wind Mill Force Pump Standards.

FIG. 413.—Plain Spout.

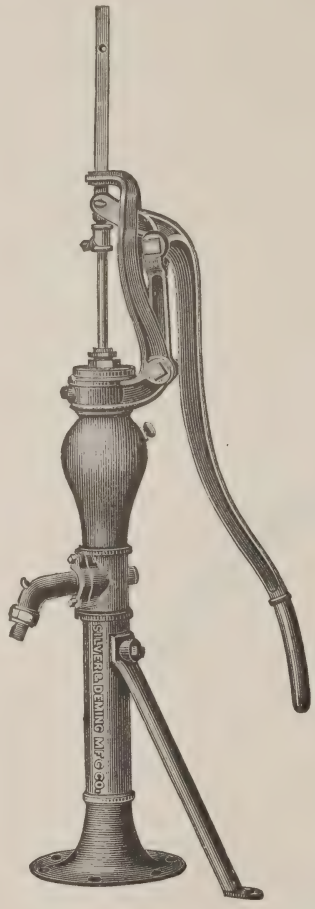
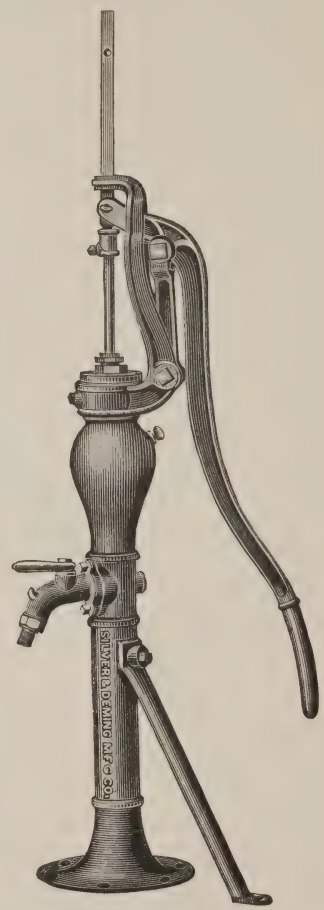


FIG. 417.—Cock Spout.



The Force Pump Standards illustrated above are the same in every part except the spout. As shown by the cuts, **Fig. 413** has a plain spout, while that of **Fig. 417** is provided with a cock. Both of these Standards have back outlet for convenience in forcing water into a tank. The pipe connection is made just below the spout which lessens liability to damage by frost. When fitted for two inch pipe they are adapted for Tubular Wells, and are furnished with Forked Wood-rod Coupling. Brass Tube Cylinders, **Figs. 312** and **322**, are best adapted for these Standards in open or drilled wells. Cylinders or Working Barrels are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
413	1¼ inch pipe.	46 inches.	Dander	$ 10.00	2 inch pipe.	50 inches.	Dandy	$ 11.50
417	1¼ " "	46 "	Danger	12.50	2 " "	50 "	Dangle	14.00

* Fitted for 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. These Pumps with 10 inch stroke for 2 inch pipe, are furnished with Forked Wood-rod Coupling for Tubular Wells.

Wind Mill Force Pump Standards.

FIG. 418.—Plain Spout.

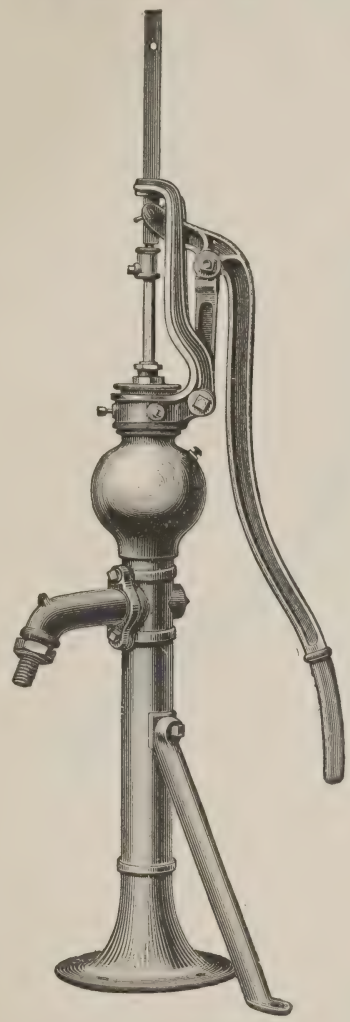
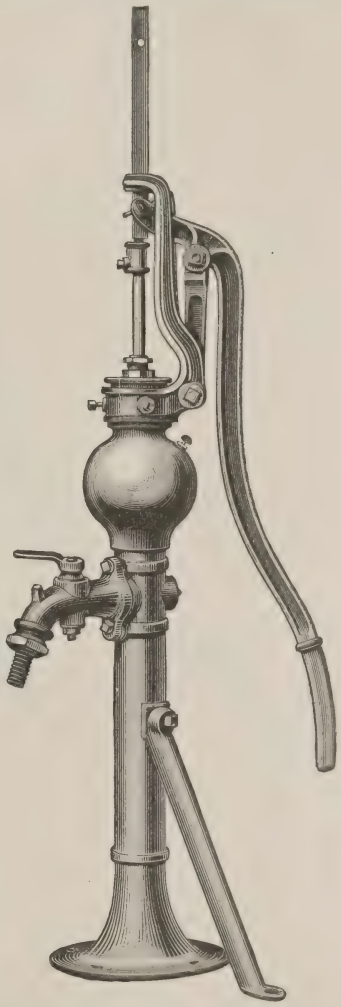


FIG. 428.—Cock Spout.



The above cuts represent **Figs. 418** and **428**, Wind Mill Force Pump Standards, which differ only in the style of spout. These Standards are tall and well proportioned, the spout is over twenty inches above the base, admitting discharge of water direct into the house tank, which makes it a desirable Pump for use in some localities, particularly in the West. When fitted for two inch pipe they are adapted for Tubular Wells, and are furnished with Forked Wood-rod Coupling. Brass Tube Cylinders, **Figs. 312** and **322**, are best adapted for these Standards in open or drilled wells. Cylinders or Working Barrels are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
418	1¼ inch pipe.	47 inches.	Dapper	$ 10.00	2 inch pipe.	51 inches.	Dappled	$ 11.50
428	1¼ " "	47 "	Daring	12.50	2 " "	51 "	Darkness	14.00

* Fitted for 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. These Pumps, with 10 inch stroke for 2 inch pipe, are furnished with Forked Wood-rod Coupling for Tubular Wells.

Wind Mill Force Pump Standard.

WITH BACK OUTLET.

FIG. 404.

The Pump Standard represented by the above cut is made heavy and strong for deep wells. Located behind the spout is an outlet for convenience in forcing water into a tank. The suction pipe connection is under the spout, which prevents liability to destructive action of the frost. This Pump is equally well adapted for hand or Wind-mill use. It is made anti-freezing in the usual way, by a drip-hole in pipe below base of Pump. The Cylinders best suited for this Standard are **Figs. 308, 309, 310, 312 and 322,** shown on pages 80 and 81. **Figs. 312** and **322,** Brass Tube Cylinders, we especially recommend.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
4	1¼ in. pipe.	47 inches.	Darling	$ 12.00	2 in. pipe.	51 inches.	Dastard	13.50
5	1¼ " "	49 "	Darted	13.00	2 " "	53 "	Dative	14.50

* Fitted for 1, 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. **Fig. 404,** with 10 inch stroke for 2 inch pipe, is furnished with Forked Rod Coupling for Tubular Wells.

Wind Mill Force Pump Standard.

WITH BACK OUTLET AND COCK SPOUT.

FIG. 411.

The above cut represents accurately **Fig. 411**, Force Pump Standard, with the Cock on Spout and Back Outlet. This Standard is particularly adapted for forcing water into an elevated Tank. In all respects, except in construction of the spout, this Pump is the same as **Fig. 404** on the preceding page. We recommend especially **Figs. 312** and **322**, Brass Tube Cylinders for use with **Fig. 411** in open or drilled wells. All our Wind Mill Pump Standards are made anti-freezing by drilling a drip-hole about three feet below the base or platform.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

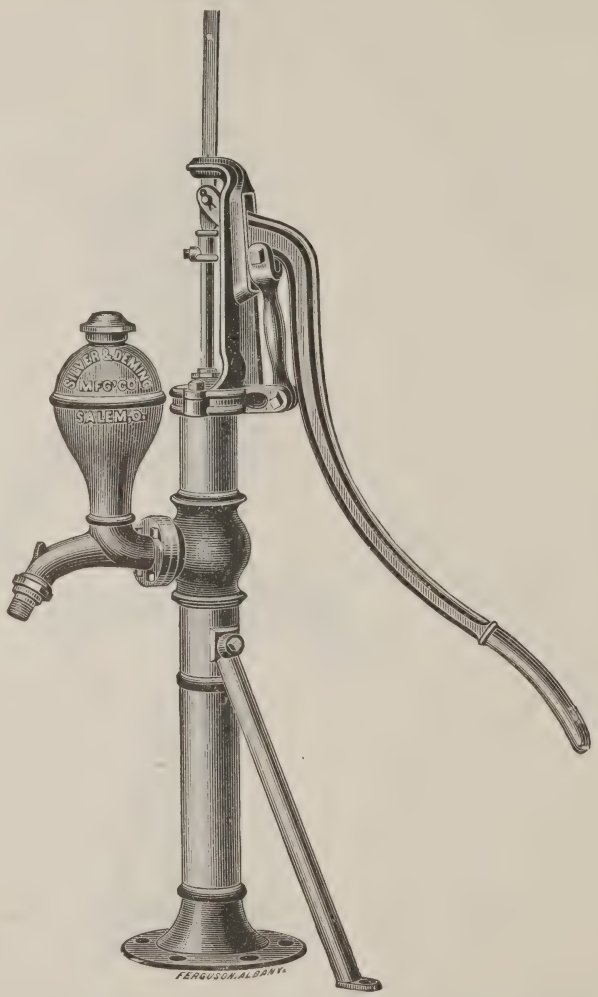
No.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	*Fitted For	Height.	Cipher.	Price.	*Fitted For	Height.	Cipher.	Price.
4	1¼ in. pipe.	47 inches.	Dauber	$ 14.50	2 in. pipe.	51 inches.	Daunted	$ 16.00
5	1¼ " "	49 "	Daubery	15.50	2 " "	53 "	Dauntless	17.00

* Fitted for 1, 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. Pumps with 10 inch stroke for 2 inch pipe, furnished with Forked Rod Coupling for Tubular Wells.

Wind Mill Force Pump Standard.

WITH AIR CHAMBER ON SPOUT.

FIG. 405.



The above cut represents a Force Pump Standard possessing all the features necessary to a perfect Wind Mill Pump. It has an outlet on top of the Air Chamber for discharging to a tank, and has a hose coupling on the spout. The Stock is threaded for pipe just below the spout. We recommend **Figs. 308, 309, 310, 312 and 322** (listed on pages 80 and 81) to be used with this Standard for open or drilled wells. We also furnish **Fig. 405** with Cock on Spout at $2.50, extra list, as below.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

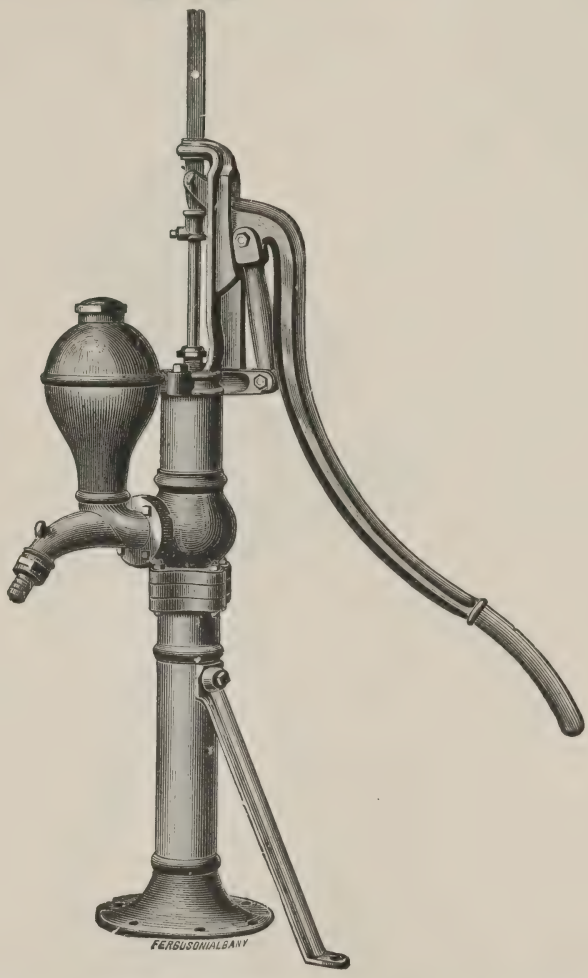
Fig. 405.	WITH SIX INCH STROKE.			WITH TEN INCH STROKE.			ADJUSTABLE STROKE.		
	*Fitted For.	Cipher.	Price.	*Fitted For.	Cipher.	Price.	*Fitted For	Cipher.	Price.
Standard Complete.	1¼ inch pipe.	Dauphin	$13.00	2 inch pipe.	Daylight	$14.50	2 inch pipe.	Dazzle	$15.50
With Cock on Spout.	1¼ " "	Dawdle	15.50	2 " "	Daytime	17.00	2 " "	Dazzling	18.00

*Fitted for 1, 1¼, 1½, or 2 inch pipe, but always as listed, unless otherwise ordered. **Fig. 405** with 10 inch and adjustable stroke for 2 inch pipe, furnished with Forked Rod Coupling for Tubular Wells. The Adjustable Stroke Pumps are adapted for 6, 8, or 10 inch stroke.

Wind Mill Force Pump Standard.

IN TWO SECTIONS. FLANGED UNDER SPOUT.

FIG. 406.



The above cut represents **Fig. 406**, which in general construction resembles **Fig. 405** Standard. It is built in two sections, with pipe flange connecting them just below the spout. This Pump Standard is similar to **Fig. 401**, in this respect.

For Drilled and Open Wells **Figs. 308, 309, 310, 312 and 322** Cylinders, on pages 80 and 81, are best adapted for use in connection with **Fig. 406.** Tubular Well Cylinders and Valves on pages 86 and 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 406.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
Standard Complete.	1¼ in. pipe.	49 inches.	Deacon	13.50	2 inch pipe.	53 inches.	Deaden	$ 15.00
With Cock on Spout	1¼ " "	49 "	Deaconry	16.00	2 " "	53 "	Deadening	17.50

* Fitted for 1¼, 1½, 2, or 2½ inch pipe, but always as listed, unless otherwise ordered. **Fig. 406**, with 10 inch stroke for 2 inch pipe, furnished with Forked Rod Coupling for Tubular Wells. Extra Flanges, 50 cents each.

Wind Mill Force Pump Standard.

WITH COCK SPOUT, AND FLANGED BASE.

FIG. 407.

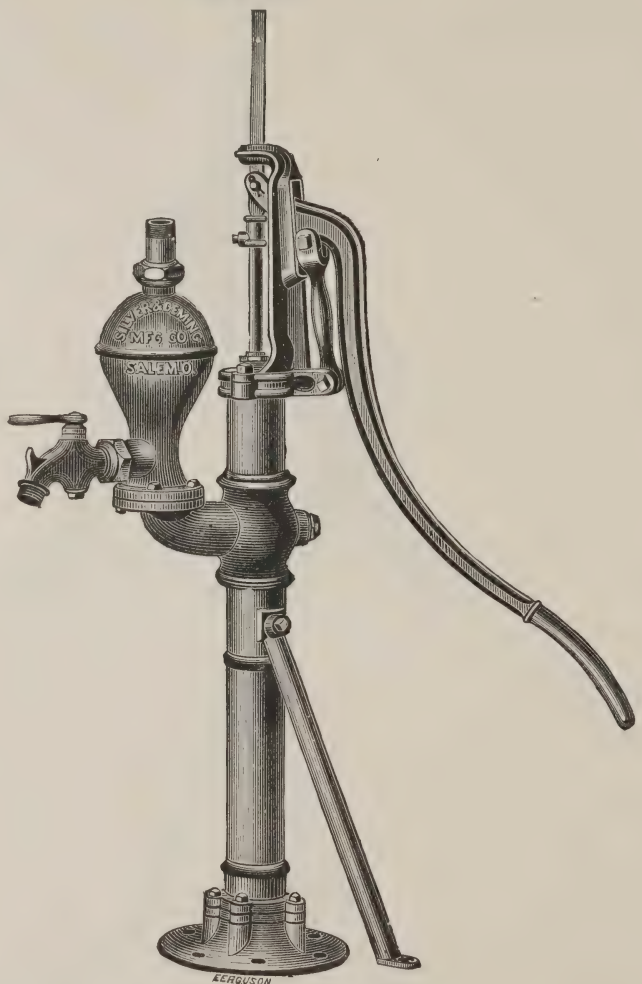


Fig. 407 represents a Pump similar in general construction and appearance to **Fig. 406**, the difference being in the Air Chamber and location of the Flange for pipe, which, in **Fig. 407**, is just above the base. It also has an upward and back outlet or discharge, and a cock on the spout. It can be attached to pipe up to three inches, which especially adapts it to large size Tubular or Artesian Wells. When placed in Open or Drilled Wells, we recommend **Figs. 312** and **322**, Brass Tube Cylinders, to be used in connection with this Standard. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig 407.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	* Fitted For	Height.	Cipher.	Price.	* Fitted For	Height.	Cipher.	Price.
Standard Complete.	1¼ in. pipe.	49 inches.	Deanery	$ 16.00	2 inch pipe.	53 inches.	Deanship	$ 17.50

* Fitted for 1¼, 1½, 2, 2½, or 3 inch pipe, but always as listed, unless otherwise ordered. **Fig. 407**, with 10 inch stroke for 2 inch pipe, furnished with Forked Rod Coupling for Tubular Wells. Extra Flanges, 50 cents each.

EXTRA HEAVY

Deep Well Force Pump Standard.

WITH WIND-MILL TOP.

FIG. 427.

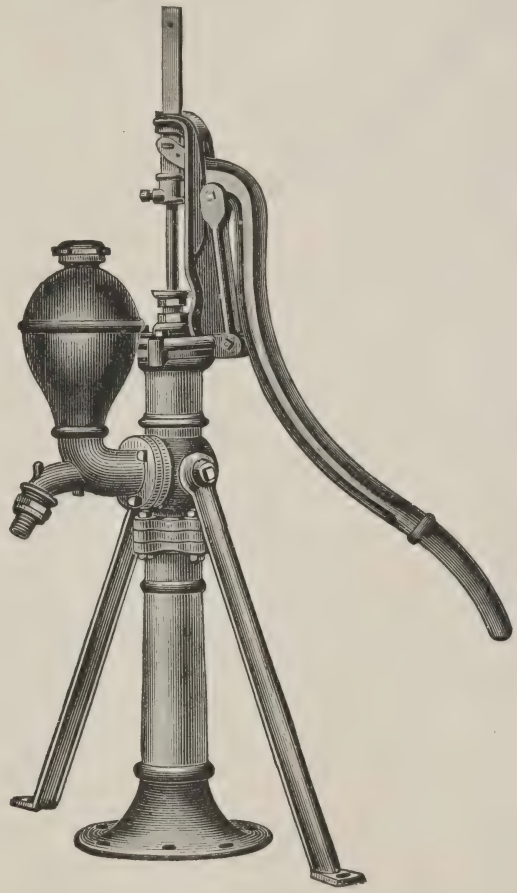


Fig. 427 is similar to **Fig. 426**, having the addition of Air Chamber and Stuffing-box, necessary to make it a Force Pump. It is the same as **Fig. 233**, with Wind-mill Top.

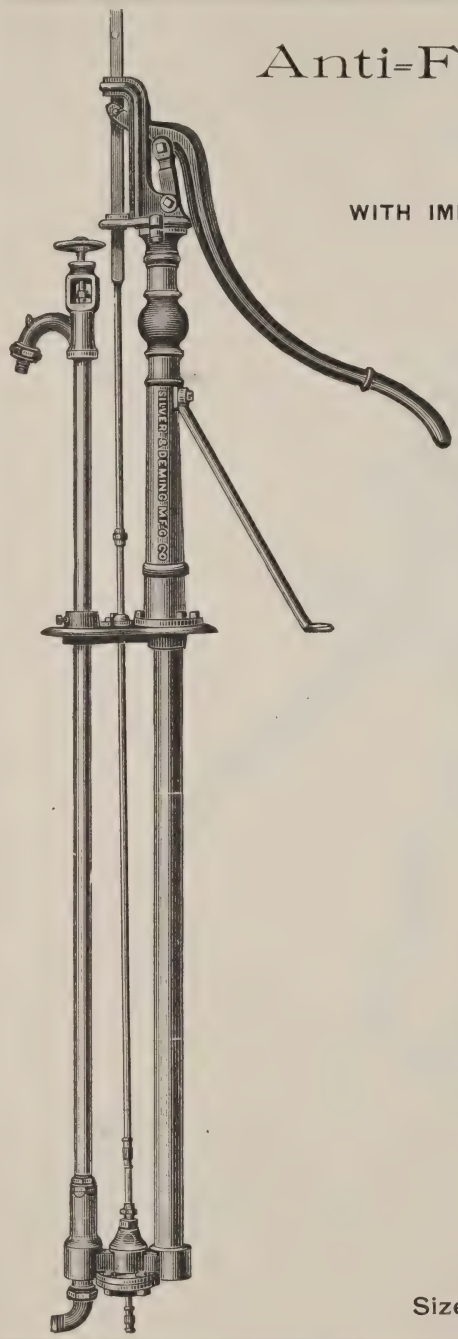
The double Braces make the Standards of this style very desirable for wells over 200 feet deep. **Fig. 427** is heavy, strong, and durable, being equally well adapted for hand or Wind Mill use. Cylinders, **Figs. 304, 305, 310, 312 and 322**, may be used in connection with these Standards. Description and lists of Cylinders on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 427.	WITH SIX INCH STROKE.				WITH TEN INCH STROKE.			
	*Fitted For	Height.	Cipher.	Price.	*Fitted For	Height.	Cipher.	Price.
Standard Complete.	1½ in. pipe.	55 inches.	Deafness	$ 21.00	2 in. pipe.	59 inches.	Dealing	$ 22.50

* Fitted for 1¼, 1½, 2, or 2½ inch pipe, but always as listed, unless otherwise ordered. Extra Pipe Flanges, 50 cents each.



Anti-Freezing Wind Mill Force Pump.

WITH IMPROVED VERTICAL DISTRIBUTING VALVE.

FIG. 410.

This Pump has been perfected to meet the requirements of the principal Wind Mill manufacturers in the United States, for a better Wind Mill Force Pump with a Three-way Valve, than had heretofore been produced. It has become the leading Anti-freezing Three-way Pump, and is accepted by Wind Mill manufacturers and dealers generally as the best *Three-way Wind Mill Force Pump* on the market. It has won its reputation on its merits, is the original Pump of its class, and has been in use for several years without a successful rival.

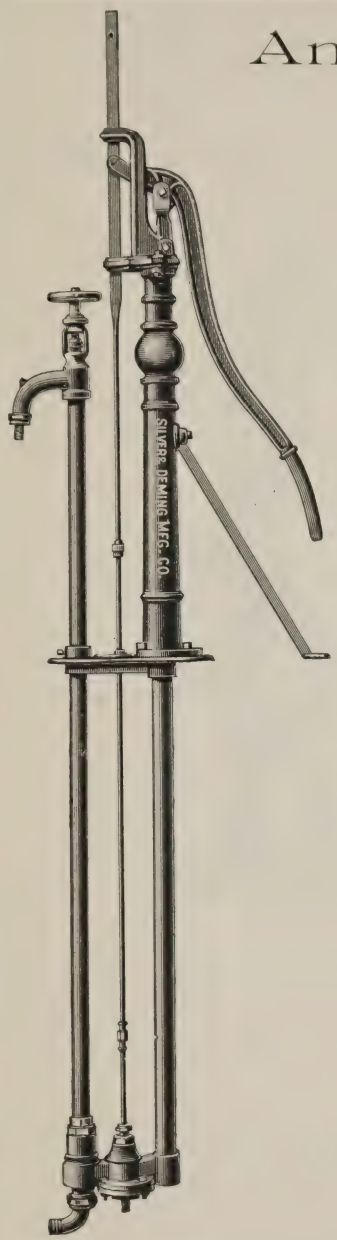
The Union Elbow Coupling for connecting to the underground discharge pipe, is of brass, and can be turned to suit the direction of the pipe. The Air Chamber Pipe is two inches in diameter, which insures ease of operation and a steady flow of water. The hose coupling on the spout also adds to the convenience of this Pump. **Fig. 410** is constructed to admit of *withdrawal of the Plunger* when used on *Tubular Wells*. In Open or Drilled Wells we recommend the use of **Figs. 312** and **322** Brass Tube Cylinders, in connection with **Fig. 410**. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 410.	WITH SIX INCH STROKE.			WITH TEN INCH STROKE.			WITH ADJUSTABLE STROKE.		
	* Fitted For	Cipher.	Price.	* Fitted For	Cipher.	Price.	* Fitted For	Cipher.	Price.
Complete, as per cut.	1¼ in. S. P. } 1 " D. P. }	Debarked	$18.00	2 in. S. P. } 1 " D. P. }	Debasing	$19.50	2 in. S. P. } 1 " D. P. }	Debatable	$ 20.50

* Fitted for 1, 1¼, 1½, 2, 2½, or 3 inch suction pipe, and ¾, 1, 1¼, 1½, or 2 inch discharge pipe, but always as listed, unless otherwise ordered. **Fig. 410**, 10 inch and adjustable stroke for 2 inch pipe, furnished with Forked Rod Coupling for Tubular Wells. Fitted for 2½ or 3 inch pipe, $1.00 extra list. Extra Pipe Flanges, $1.00 each.



Anti-Freezing Wind Mill Force Pump.

WITH IMPROVED VERTICAL DISTRIBUTING VALVE.

FIG. 415.

The annexed cut represents our new Anti-freezing Three-way Wind Mill Force Pump, **Fig. 415.**

The construction of this Pump is the same as that of **Fig. 410.** It has been placed on the market to meet an increasing demand for a lighter and cheaper Pump of its class, and for all ordinary work it will be found quite efficient. The main difference between this Pump and **Fig. 410** is in the lighter weight of the former, and in the size of Air Chamber Pipe, which is 1½ inch instead of 2 inches, as in **Fig. 410.**

When **Fig. 415** is used on Tubular Wells the Plunger may be withdrawn the same as in **Fig. 410.**

In Open or Drilled Wells, **Figs. 312** and **322** are the most suitable Cylinders for this Pump. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig.	WITH SIX INCH STROKE.			WITH TEN INCH STROKE.		
	* Fitted For	Cipher.	Price.	* Fitted For	Cipher.	Price.
415	1¼ inch suction pipe. } 1 " discharge " }	Debauch	$ 17.00	2 inch suction pipe. } 1 " discharge " }	Debenture	$ 18.50
†416	"	Debilitate	16.00	"	Debility	17.50

† **Fig. 416** is the same as **Fig. 415,** except that 1¼ inch pipe is used for Air Chamber instead of 1½ inch; and it is not arranged to draw out Plunger in Tubular Wells.

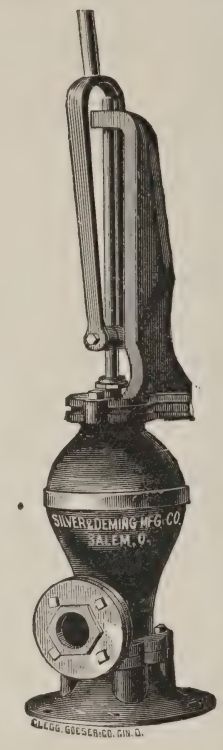
* Fitted for 1, 1¼, 1½, or 2 inch suction pipe, and ¾, 1, or 1¼ inch discharge pipe, but always as listed, unless otherwise ordered. Ten inch stroke Pumps, for 2 inch pipe, furnished with Forked Rod Coupling, for Tubular Wells. Extra Flanges, for **Fig. 415** or **416,** $1.00 each.

Deep Well Working Heads.

WITH FLANGED BASE.

FIG. 432—With Wind-Mill Top.

FIG. 433—With Pitman for Power.



The above Force Pump Working Heads are the same in general construction. **Fig. 432** is arranged for Wind Mill or hand use, and **Fig. 433** has, instead of a Wind Mill attachment, a Pitman, adapting it for any kind of power.

These Working Heads may be used in connection with a Cylinder, in places where a large Standard would be impracticable. Cylinders, **Figs. 304, 305, 309, 312, 322, 314, and 315,** are adapted for this Working Head. Cylinders or Working Barrels are described and listed on pages 77 to 87.

A Flange is placed between the Base and the Air Chamber, and may be threaded for any size suction pipe up to three inches. Forked Couplings for connecting to Wood Rods are furnished at an additional cost as given below. These Pumps are always fitted for ½ inch rod, unless otherwise ordered, but can be fitted for ⅜ or ½ inch gas pipe.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig.	* Suction Fitted For	*Discharge Fitted For	WITH SIX INCH STROKE.		WITH TEN INCH STROKE.	
			Cipher	Price.	Cipher.	Price.
432	1½ inch pipe.	1¼ inch pipe.	Debonair	$ 13.00	Decade	$ 14.50
433	1½ " "	1¼ " "	Debutant	15.00	Decadence	16.50

* Fitted for 1, 1¼, 1½, 2, 2½, or 3 inch suction or discharge pipe, but always as listed, unless otherwise ordered. Forked Rod Coupling for connecting to Wood Rod, furnished at $1.50 extra list.

Texas Deep Well Working Head.

WITH DOUBLE ROD GUIDE, AND POWER ATTACHMENT.

FIG. 436.

The annexed cut represents a new style of Working Head, which is especially adapted to the deep wells of Texas and other parts of the west. Our Artesian Well Cylinders, **Figs. 314 and 324**, and Deep Well Cylinders, **Fig. 315**, are well adapted for use in connection with this Working Head.

Fig. 436 may be used with Wind Mill or other power, the double Rod Guide always keeping the Piston in line; the power attachment is hinged and arranged to fit the Wood Rod of Wind Mill. A Stuffing-box adapts this Working Head for forcing water, the discharge being made below by a Tee in the suction pipe. An Air Chamber may be constructed of pipe on the discharge, if desired.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 436.	* Fitted For	Length of Stroke.	Cipher.	Price.
Complete.	3 inch pipe.	16 inches.	Decalogue	$ 15.00

* Fitted for 2, 2½, or 3 inch suction pipe, but always as listed, unless otherwise ordered.

IMPROVED

Mine and Deep Well Pump Head.

WITH PITMAN, FOR POWER.

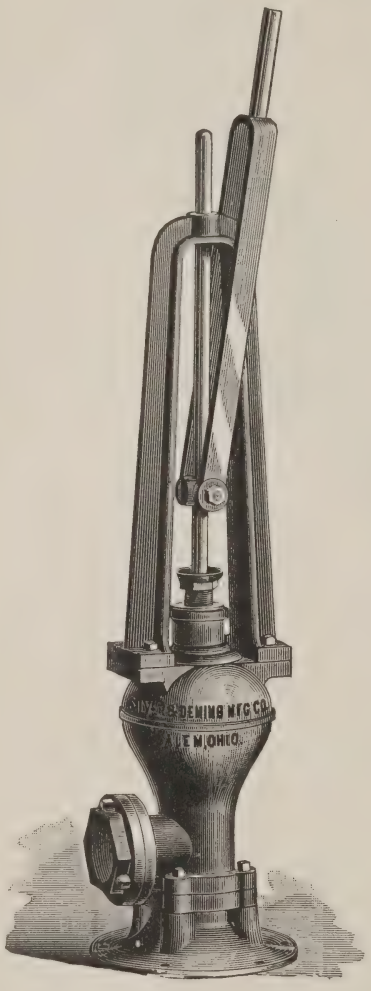


FIG. 435.

This Force Pump Working Head is especially adapted for use in Mines, and Artesian or Deep Wells.

The suction pipe is attached to a flange in the base and the discharge pipe to a flange on the side of the Air Chamber. Artesian Well Brass Cylinders, **Figs. 314 and 324,** and metallic-fitted Brass Tube Cylinder, **Fig. 315,** are best adapted for use in connection with these Working Heads.

Cornish Mine Pump Cylinder, **Fig. 345,** may also be used with **Fig. 435,** in mines or wells not over 100 to 150 feet deep. We make two sizes of this Working Head, designated as Nos. 1 and 2; the former having ten inch and sixteen inch stroke; and the latter, sixteen, twenty-four, and thirty inch stroke, as ordered.

These Pump Heads will be fitted for $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, or 1 inch rod, or $\frac{3}{8}$, $\frac{1}{2}$, or $\frac{3}{4}$ inch pipe for Piston-rod, but No. 2 is always fitted with $1\frac{1}{16}$ inch rod for $\frac{3}{4}$ inch pipe; and No. 1 with $\frac{7}{8}$ inch rod, for $\frac{1}{2}$ inch pipe, unless otherwise ordered.

Description and lists of Cylinders on pages 77 to 87.

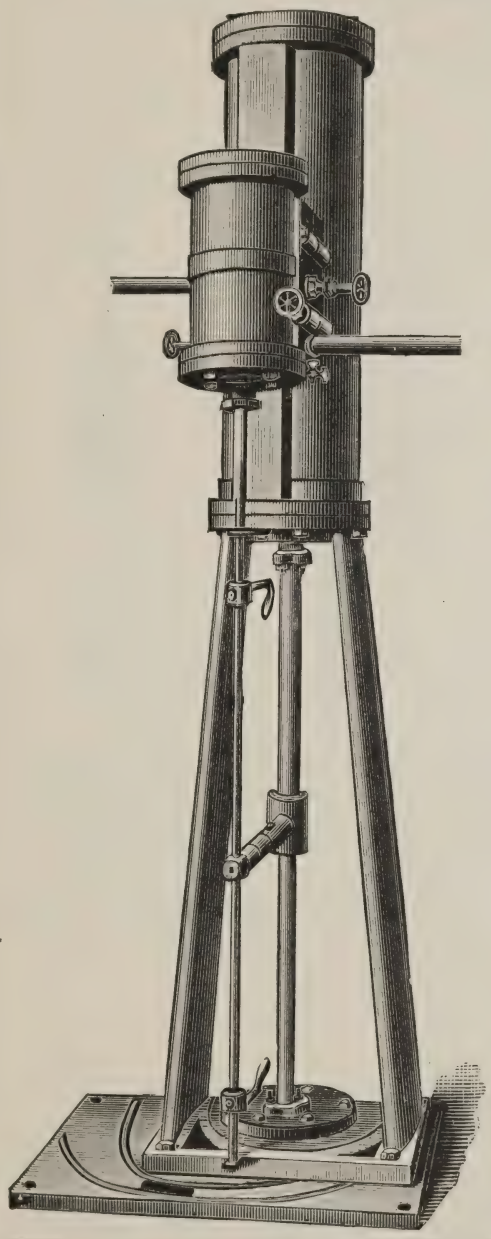
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	*Suction, Fitted For	*Discharge, Fitted For	Length of Stroke.	Cipher.	Price.
1	1¼ inch pipe.	1¼ inch pipe.	10 inches.	Deceit	$ 30.00
1	1¼ " "	1¼ " "	16 "	Deceitful	35.00
2	3 " "	3 " "	16 "	Deceive	70.00
2	3 " "	3 " "	24 "	Decency	90.00
2	3 " "	3 " "	30 "	Decent	100.00

* No. 1 Working Head can be fitted for any size suction and discharge pipe up to and including 3 inch; and No. 2 can be fitted for suction pipe up to and including 6 inch, with discharge pipe up to and including 4 inch. *They will be fitted as listed,* unless otherwise ordered.

Deep Well
Steam Pump Working Head.



WITH DIRECT-ACTING PISTON-ROD.

FIG. 438.

This Direct Acting Vertical Steam Pump is adapted for pumping from Deep Drilled Wells, or from Artesian Wells, where the water does not rise higher than twenty-five or thirty feet from the surface of the ground. It will pump from wells 1,000 feet (or more) in depth, and will deliver the water to any point desired.

We recommend **Figs. 314 and 324**, Artesian Well Brass Cylinders, as best adapted for use in connection with this Steam Pump Head. Mine Pump Cylinder, **Fig. 345**, may also be used to advantage. This Pump is made in four sizes; the entire Working Head being constructed to swing on its base for convenience in repairing. The stroke is adjustable and can be shortened to suit the length of Cylinder.

Description and Lists of Cylinders on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Diameter Steam Cylinder.	Length of Stroke.	Diameter of Pump Cylinder.	Cipher.	Price.
3	5 inches.	24 inches.	2½ to 4 inches.	Deciduous	$ 225 00
6	8 "	36 "	4 to 6 "	Decimal	325.00
8	10 "	36 "	6 to 8 "	Decipher	375.00

IMPROVED

Wind Mill Stuffing-Box Heads.

WITH BRASS-CASED ROD.

FIG. 446.

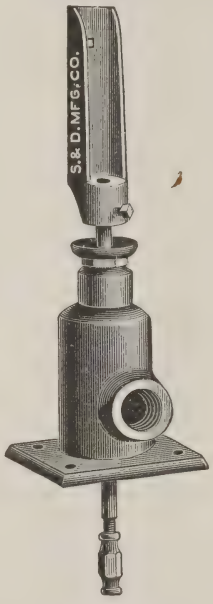


FIG. 447.

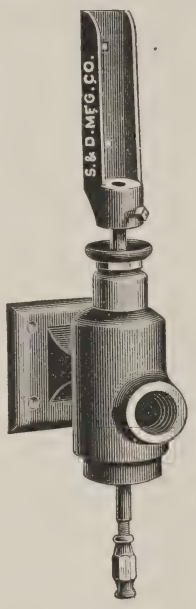


FIG. 448.

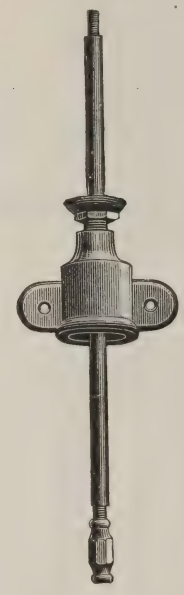


FIG. 449.

The above cuts represent different styles of Stuffing-box Heads for Wind Mill use. They may be used in shallow or deep wells, where it is not considered necessary to invest in a Force Pump Standard. These Stuffing-box Heads are made of iron (except **Fig. 449**, which is all brass) with the gland of brass, and brass-cased rod. All have a Rod Coupling at lower end of rod, and, if ordered, **Figs. 448** and **449** are fitted with coupling on both ends of the rod. **Figs. 446** and **447** have Wind Mill attachment at top and have a discharge connection above the suction. The discharge from **Figs. 448** and **449** is made by a Tee attached to the suction pipe below. These Heads may be used on tubular wells, and in open or drilled wells. In the latter case, Brass Tube Cylinders, **Figs. 312** and **322**, are best adapted. Cylinders are described and listed on pages 77 to 87.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

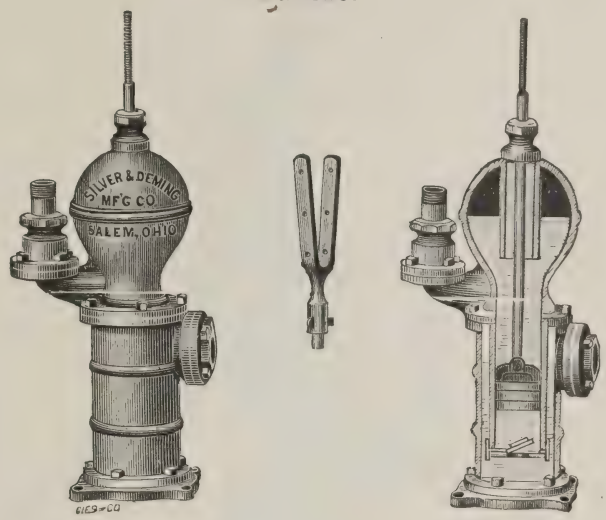
Fig.	*Fitted For	Stroke.	Cipher.	Price.
446	1¼ inch pipe.	10 inches.	Decamp	$6 00
447	1¼ " "	10 "	Decanter	6 00
448	1¼ " "	10 "	Decapitate	3.00
449	1¼ " "	10 "	Decayed	4.00

*Fitted for, 1, 1¼, 1½, or 2 inch suction pipe, but always for 1¼ inch, unless otherwise ordered. **Figs. 446** and **447** can be fitted for any of these four sizes of discharge pipe, but will always be fitted with same size discharge as suction pipe, unless otherwise ordered.

Syphon Force Pump.

WITH SUBMERGED CYLINDER.

FIG. 320.



The above cuts represent our improved Syphon Pump, in which the Cylinder or Working Barrel is always immersed. This is accomplished by the suction pipe entering above the lower valve. The Pump is thus always primed, and is not liable to get out of working order. It has a Brass Plunger, and the Cylinder is either *Brass-lined*, or *all Brass*, as ordered. This Pump is adapted for use in places where it can be located within twenty-five feet of the water. The horizontal distance, if not too great, does not effect the working of this Pump; it is, therefore, often used to advantage for pumping from streams, springs, lakes, etc., a distance away from the Pump.

The Piston-rod is arranged for power, and a Forked Coupling, for attaching to the Wind Mill Wood Rod, is furnished, when so ordered. The cuts show a view of the Pump complete; also a sectional view displaying the Cylinder and working parts. The small cut represents the Coupling for Wind Mill Rod.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	*Suction Pipe.	*Discharge Pipe	Stroke.	BRASS-LINED CYLINDER.		BRASS CYLINDER.	
					Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1½ inch.	1¼ inch.	8½ in.	Decker	$ 25.00	Declivity	$ 28.00
2	3 "	1½ "	1½ "	8½ "	Declaim	25.25	Decoction	28.25
3	3½ "	2 "	2 "	8½ "	Declaimer	27.25	Decolor	32.25
4	4 "	2 "	2 "	10 "	Declared	30.50	Decompose	35.50
5	5 "	2½ "	2½ "	10 "	Declension	50.00	Decorate	58.00
6	6 "	3 "	3 "	10 "	Declinable	64.00	Decorum	74.00

* Fitted for other size suction or discharge pipe, but always as listed, unless otherwise ordered.

Forked Coupling for Wind Mill Rod, $1.50 extra list. Larger sizes Syphon Pumps made to order.

Syphon Force Pump.

WITH WIND-MILL TOP.

FIG. 321.

Fig. 321 is precisely the same as **Fig. 320** in the construction of its working parts; the difference being the addition of a Wind-mill Top with handle, which adapts this Pump both for Wind Mill and hand use. It is always furnished with Connecting Slide for attaching to the Wood Rod of Wind Mill.

Being the same in general construction, **Fig. 321** will work under the same conditions as **Fig. 320.** We furnish a Goose Neck Spout with **Fig. 321,** when so ordered, at additional price given below.

This Spout is shown in cut detached from the Pump.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	*Suction Pipe.	*Discharge Pipe	Stroke.	BRASS-LINED CYLINDER.		BRASS CYLINDER.	
					Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1½ inch.	1¼ inch.	8½ in.	Decrease	$ 28.50	Deeply	$ 31.50
2	3 "	1½ "	1½ "	8½ "	Decrepit	28.75	Deface	31.75
3	3½ "	2 "	2 "	8½ "	Decried	31.00	Defame	36.00
4	4 "	2 "	2 "	10 "	Dedicate	37.50	Default	42.50
5	5 "	2½ "	2½ "	10 "	Deduced	55 00	Defeated	63.00
6	6 "	3 "	3 "	10 "	Deeded	70.00	Defending	80.00

* Fitted for other sizes suction and discharge pipe, but always as listed, unless otherwise ordered. Larger sizes Syphon Pumps made to order. Goose Neck Spout for **Fig. 321,** Nos. 1 to 4 furnished at $1.00 extra list.

Cylinders or Working Barrels.

The Cylinder or working section of a Pump is that part which does the actual work of pumping; and if the Cylinder is in any way defective the Pump will not work with any degree of certainty. Every other part of a Pump may be in perfect order, and the defective Cylinder will render the Pump comparatively worthless. We manufacture a full line of Cylinders of different styles and for various purposes. These are illustrated and listed on the next ten pages. In our factory we take especial pains in the construction of Cylinders. All parts being made to exact gauges, repairs will always fit, and the parts will go together accurately. To insure this, a careful inspection of all Cylinders is made before they are shipped from the factory. Our Iron and Cast Brass Cylinders are all bored out perfectly true, and are highly polished. The Brass Tube Cylinders are made of heavy seamless Brass Tubing, with Iron or Brass attachments; and for accuracy in construction and ease of operation, they cannot be excelled.

Our Brass-lined Cylinders are made similar to the Iron Cylinders, the shell being bored out smoothly, and enough to insert a lining of Brass Tubing of the proper inside diameter. The lining is forced in and swaged to position. These Cylinders possess the smoothness of the Brass Tube Cylinders, and are not so likely to become injured by external pressure or sudden jars. The lists on the following pages give the sizes of pipe the Cylinders are fitted for; but if other sizes of pipe are to be used we can generally fit the Cylinder attachments to suit; however, we *recommend the Cylinders to be fitted as listed*, since practical usage has demonstrated them to be best adapted for sizes of pipe as given in the lists.

The following are the necessary parts of a Cylinder or Working Barrel, viz.: **Body or Shell, Top Attachment, Bottom Attachment, Plunger** (**Cage, Poppet Valve, Follower, and Leather Packing**), **and the Lower Valve.** In order that the Pump operate properly these parts must be in perfect condition, and the joints of the Cylinder should be air-tight.

Plungers for Cylinders.

The various styles of Plungers used in our Cylinders are shown by cuts next to those of the Cylinders.

"A" Plunger is all iron, with leather packing; it is used in **Figs. 300, 301, and 308.**

"B" Plunger is constructed with Brass Cage and Valve with leather packing, and has water-grooved Iron Follower 2 inches long; it is used in **Figs. 302, 303, 309; and Figs. 312 and 322,** 14 inches long.

"C" Plunger has a Brass Cage and Valve, and leather packing, with water-grooved Iron Follower 5 inches long. It is used in **Figs. 304, 305, 316; and Figs. 312 and 322,** 16, 18, and 20 inches long.

"F" Plunger is all Brass; it has leather packing, and the Follower is turned to fit the Cylinder perfectly. It is used in **Figs. 312 and 322,** 10 and 12 inches long.

"G" Plunger is the same as "A" Plunger, with flat rod for attaching to the rod of Wood Pump. It is used in **Fig. 318.**

"H" Plunger (not shown by a cut) is a solid Piston Plunger, with double-cupped leather packing. It is used in Double-acting Cylinder **Fig. 319,** and in our Double-acting Pumps.

For Open Wells, we recommend **Figs. 300, 301, 302, 304, 308, 309, 310, 312, 314, 324, 316, and 319;** and for Drilled Wells, we recommend **Figs. 303, 305, 322, and 315.**

The Cylinders above referred to, listed on the following pages, are used in connection with Pump Standards and Working Heads shown on the preceding pages.

For the convenience of those who are ordering Cylinders, and desire to know the outside diameters, we append the table below.

Table Showing Outside Diameter of Cylinders.

INSIDE DIAMETER IN INCHES.	1⅜	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5¾	6
OUTSIDE DIAMETERS.																		
Figs. 300, 302, and 304				3	3¼	3¾	4	4¼	4½	4¾		5¼		6		7⅛		7¾
Figs. 303 and 305				2¾	3	3¼	3½	3¾	4	4¼		4¾		5¼		5¾		6¾
Figs. 308, 309, and 310				3	3¼	3¾	4	4¼	4½	4¾		5¼		6		7⅛		7¾
Fig. 312				2¾	3	3¼	3½	3¾	4	4¼		4¾		5½		6		7
Fig. 322		1¾	2	2¼	2½	2¾	3	3¼	3½	3¾		4¼		4⅞		5⅜		6⅜
Fig. 315				2¼		2¾		3¼		3¾		4½		5		5½		6½
Figs. 314 and 324	2¾		3¼		3⅜		4		4⅝		5		5¾		6		7½	
Fig. 316						6½	6½	6½	6½	7¼	7¼	7¼						
Fig. 318								4¼	4½	4¾		5½						
Fig. 319					7½			7¾				12						

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

IMPROVED SHALLOW WELL
Pump Cylinders or Working Barrels

FIG. 300.

FIG. 301.

FIG. 302.

FIG. 303.

Cylinders Figs. 300 and 301, with "A" Plunger.

Size.	Stroke.	*Fitted for Pipe.	IRON.		BRASS BODY.		BRASS BODY AND PLUNGER.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2 x10	6 inch.	1 inch.	Cabal	$3.75	Cabinet	$ 7.25	Cadaver	$ 8.00	Caffre	$ 8.75
2¼x10	6 "	1¼ "	Cabalist	4.00	Cabob	7 50	Caddis	8.25	Cahoot	9.00
2½x10	6 "	1¼ "	Cabalize	4.35	Caboose	8.00	Caddy	8.75	Caique	9.50
2¾x10	6 "	1¼ "	Caballer	4.70	Cabriolet	8 75	Cadence	9.75	Cairn	10.50
3 x10	6 "	1¼ "	Cabaret	5.00	Cachet	9.50	Cadet	10.50	Caisson	11.50
3¼x10	6 "	1¼ "	Cabas	5.30	Cackle	10.50	Cadger	11.50	Cajeput	12 50
3½x10	6 "	1½ "	Cabbage	5.60	Cackling	11.50	Cadmium	12.50	Cajole	14.50
4 x10	6 "	2 "	Cabin	6.50	Cactus	14.00	Cafe	15.00	Calade	17.00

N. B.—The Cipher words apply to **Fig. 300**; when **Fig. 301** is wanted, add the word "Bolted" to the Cipher word.

Cylinders Figs. 302 and 303, with "B" Plunger.

Size.	Stroke.	*Fitted for Pipe.	IRON.		BRASS BODY.		BRASS BODY AND PLUNGER.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2 x12	6 inch.	1 inch.	Calamine	$ 5.50	Caliber	$10.00	Calyon	$ 11.00	Caned	$12.50
2¼x12	6 "	1¼ "	Calamist	5.75	Calibrate	10.50	Calyx	11.50	Cannibal	13.00
2½x12	6 "	1¼ "	Calamite	6.00	Calico	11.50	Cameo	12 50	Cannon	14.00
2¾x12	6 "	1¼ "	Calamity	6.50	Caliph	11.75	Camera	13.25	Canny	15.00
3 x12	6 "	1¼ "	Calamus	7.00	Calque	12.75	Camp	14.25	Canoe	16.25
3¼x12	6 "	1¼ "	Calash	7 50	Calker	14 00	Camped	15.00	Canyon	17.50
3½x12	6 "	1½ "	Calcar	8.00	Called	15 50	Camping	17.50	Canonize	20.00
4 x12	6 "	2 "	Calciform	9.25	Calliope	21.50	Campus	24.00	Cantilever	27.00
2 x14	8 "	1 "	Calcify	6.00	Callous	10.25	Canal	11.50	Canteen	13.00
2¼x14	8 "	1¼ "	Calcinate	6.25	Calmer	11.25	Canard	12.50	Canter	14.00
2½x14	8 "	1¼ "	Calcine	6.50	Calmly	11.75	Canary	13.00	Canvas	14.50
2¾x14	8 "	1¼ "	Calcite	7.00	Calomel	12.50	Canaster	14.00	Capable	15.75
3 x14	8 "	1¼ "	Calcium	7.50	Caloric	13.50	Cancer	15.00	Capital	16.75
3¼x14	8 "	1¼ "	Calculate	8.00	Calorific	15.00	Candid	16.75	Capon	18.25
3½x14	8 "	1½ "	Calculus	8.50	Calotype	16.50	Candidate	19.00	Capper	21.50
4 x14	8 "	2 "	Calefy	10.00	Calumny	23.75	Candor	27.00	Capsicum	29.50
4½x14	8 "	2 "	Calendar	12.50	Calvinism	26.00	Candy	31.00	Capsize	34.00
5 x14	8 "	2½ "	Calenture	14.25	Calvish	29.00	Cane	35.00	Capsule	39.00

The above Cipher words apply to **Fig. 302**; when **Fig. 303** (which has inside attachments) is wanted, add the word "Inside" to the Cipher word. Brass Body and all Brass Cylinders are made of Cast Brass.

* Fitted for other sizes of Pipe when so ordered, but we recommend the use of Pipe according to the sizes as listed.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

N. B.—Outside diameters of all styles and sizes of Cylinders are given on page 77.

IMPROVED DEEP WELL

Pump Cylinders or Working Barrels

FOR OPEN AND DRILLED WELLS.

FIG. 304.—Outside Attachments
FOR OPEN WELLS.

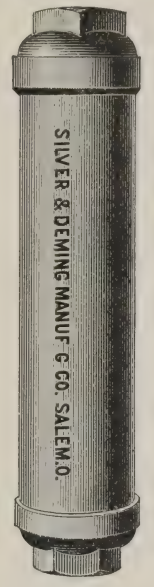


FIG. 305.—Inside Attachments
FOR DRILLED WELLS.

C

Cylinders Figs. 304 and 305, with "C" Plunger.

Size.	†Stroke.	*Fitted for Pipe.	IRON.		BRASS BODY.		BRASS BODY AND PLUNGER.		ALL BRASS.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price	Cipher.	Price.
1½x16	10 inch.	1 inch.	. . . . .	$. .	Carcass	$10.50	Carouser	$12.00	Casino	$13.50
1¾x16	10 "	1 "	. . . . .	. .	Cardinal	10.50	Carpenter	12.00	Casket	13.50
2 x16	10 "	1 "	Captain	6.00	Career	10.50	Carpentry	12.00	Casque	13.50
2¼x16	10 "	1¼ "	Captious	6.50	Careful	12.00	Carpet	13.50	Cassia	15.00
2½x16	10 "	1¼ "	Captive	7.00	Careless	12.50	Carrion	14.00	Cassock	15.00
2¾x16	10 "	1¼ "	Capuchin	7.50	Cargo	13.00	Carrot	14.50	Castanet	16.25
3 x16	10 "	1¼ "	Capulet	8.00	Caribou	14.00	Cartilage	15.50	Caster	17.50
3¼x16	10 "	1¼ "	Caramel	8.50	Carmine	16.00	Cartoon	18.00	Castigate	20.00
3½x16	10 "	1½ "	Carat	9.00	Carnage	18.50	Cartridge	21.00	Castilian	23.50
4 x16	10 "	2 "	Carbine	10.50	Carnal	26.00	Carver	29.00	Castle	32.50
4½x16	10 "	2 "	Carbon	13.00	Carnival	30.00	Carving	35.00	Casual	40.00
5 x16	10 "	2½ "	Carbonic	15.50	Carol	35.00	Cascade	41.00	Casuist	48.00
6 x16	10 "	3 "	Carbuncle	22.00	Carouse	41.00	Casement	49.00	Casuistry	60.00

The above Cipher words apply to **Fig. 304**; when **Fig. 305** is wanted, add the word "Inside" to the Cipher word. The Brass Body and all Brass Cylinders are made of *Cast Brass*.

† **Fig. 304** (which has outside attachments) will allow of a 10 inch stroke. **Fig. 305** (which has inside attachments) will allow of an 8 inch stroke.

* Fitted for other sizes of Pipe, when so ordered; but we recommend the use of Pipe according to the sizes as listed.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

N. B.—Outside Diameters of all styles and sizes of Cylinders are given on page 77.

IMPROVED
Brass-Lined Iron Cylinders.

FOR SHALLOW AND DEEP WELLS.

FIG. 308.

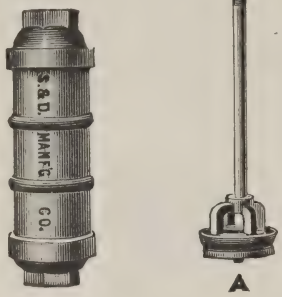


Fig. 308, with "A" Plunger.

Size.	Stroke.	*Fitted for Pipe.	IRON PLUNGER.		BRASS PLUNGER.	
			Cipher.	Price.	Cipher.	Price.
2 x10	6 inch.	1 inch.	Catacomb	$ 6.75	Catechism	$ 7.50
2¼x10	6 "	1¼ "	Catamaran	7.25	Category	8.00
2½x10	6 "	1¼ "	Catapult	7.75	Cater	8.25
2¾x10	6 "	1¼ "	Cataract	8.25	Catered	8.75
3 x10	6 "	1¼ "	Catawba	8.75	Cathedral	9.25
3¼x10	6 "	1¼ "	Catcher	9.25	Catholic	10.00
3½x10	6 "	1½ "	Catsup	9 75	Catnip	10.75
4 x10	6 "	2 "	Catechise	10.50	Caucus	12.00

FIG. 309.

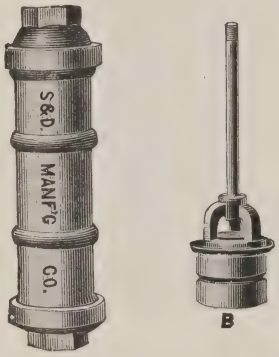


Fig. 309, with "B" Plunger.

Size.	Stroke.	*Fitted for Pipe.	IRON FOLLOWER, BRASS CAGE & VALVE.		ALL BRASS PLUNGER.	
			Cipher.	Price.	Cipher.	Price.
2 x12	6 inch.	1 inch.	Cautious	$ 7.50	Cellar	$ 8.50
2¼x12	6 "	1¼ "	Cavalcade	8.00	Cellular	9.00
2½x12	6 "	1¼ "	Cavalier	8.50	Cellulose	9.50
2¾x12	6 "	1¼ "	Cavalry	9 00	Celtic	10.00
3 x12	6 "	1¼ "	Cavern	9.50	Cement	10.50
3¼x12	6 "	1¼ "	Cavil	10.00	Censor	11.25
3½x12	6 "	1½ "	Cavilling	10.50	Censure	12.00
4 x12	6 "	2 "	Cavity	12.50	Centaur	15.00
2 x14	8 "	1 "	Cayenne	8.25	Centenary	9.25
2¼x14	8 "	1¼ "	Cedar	8.75	Centipede	9.75
2½x14	8 "	1¼ "	Cedilla	9.25	Centuple	10.50
2¾x14	8 "	1¼ "	Celerity	9.75	Century	11.00
3 x14	8 "	1¼ "	Celery	10.25	Ceramic	11.50
3¼x14	8 "	1¼ "	Celestial	10.75	Cereal	12.50
3½x14	8 "	1½ "	Celibate	11.25	Cerebral	13.25
4 x14	8 "	2 "	Celibacy	14.00	Ceremony	17.00

FIG. 310.

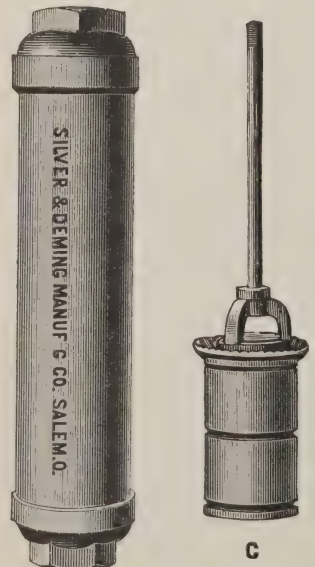


Fig. 310, with "C" Plunger.

Size.	Stroke.	*Fitted for Pipe.	IRON FOLLOWER, BRASS CAGE & VALVE.		ALL BRASS PLUNGER.	
			Cipher.	Price.	Cipher.	Price.
2 x16	10 inch.	1 inch.	Certificate	$ 9.00	Chalet	$10.00
2¼x16	10 "	1¼ "	Cessation	9.50	Chalice	10.75
2½x16	10 "	1¼ "	Cestus	10.00	Chamfer	11.50
2¾x16	10 "	1¼ "	Chaffer	10.50	Chamois	12.00
3 x16	10 "	1¼ "	Chagrin	11.00	Champagne	12.75
3¼x16	10 "	1¼ "	Chairman	11.50	Chancel	13.75
3½x16	10 "	1½ "	Chaise	12.00	Channel	14.50
4 x16	10 "	2 "	Chaldean	15.75	Chanted	19.00

*Fitted for other sizes of Pipe when so ordered, but we recommend the use of Pipe according to the sizes as listed.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, papes 9 to 12.

N. B.—Outside Diameters of all styles and sizes of Cylinders are given on page 77.

Seamless Brass Tube Cylinders.

FOR SHALLOW AND DEEP WELLS.

FIG. 312. **FIG. 322.**

10 and 12 inches long.

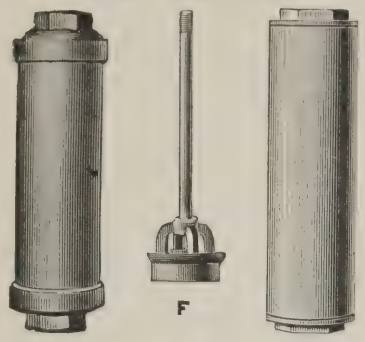


FIG. 312. **FIG. 322.**

14 inches long.

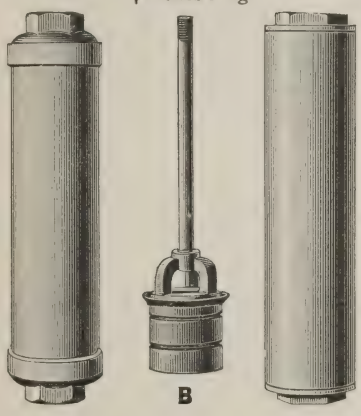
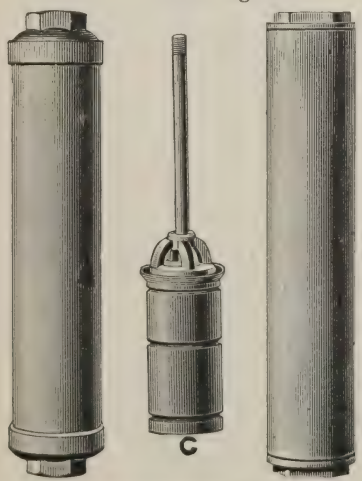


FIG. 312. **FIG. 322.**

16 inches long.



Figs. 312 and 322, 10 and 12 inches long, with "F" Plunger.

Size.	Fitted for Pipe	Iron Attachments.		All Brass.	
		*Cipher.	Price.	*Cipher.	Price.
2 x10	1 inch.	Chaos	$ 7.50	Chasten	$ 8.25
2¼x10	1¼ "	Chaotic	7.75	Chastise	8.50
2½x10	1¼ "	Chapeau	8.00	Chatter	8.75
2¾x10	1¼ "	Chapel	8.50	Cheater	9.25
3 x10	1¼ "	Chaplet	9.00	Checkers	10.00
3¼x10	1¼ "	Chaperon	9.75	Cheek	10.75
3½x10	1½ "	Chaplain	10.50	Cheese	12.00
4 x10	2 "	Character	14.00	Chemist	16 00
2 x12	1 "	Charade	8.00	Chemistry	9.00
2¼x12	1¼ "	Charger	8.25	Cherish	9.25
2½x12	1¼ "	Chariot	8.50	Cherry	9 50
2¾x12	1¼ "	Charity	9.00	Cherub	10.00
3 x12	1¼ "	Charlatan	9.50	Chess	11.00
3¼x12	1¼ "	Charmer	10.25	Chestnut	11 75
3½x12	1½ "	Charon	11.25	Chicane	13.50
4 x12	2 "	Chartered	15.00	Chicory	18.50

N. B.—**Fig. 312**, 10 inches long, has 6 inch stroke; 12 inches long, 8 inch stroke. The stroke of **Fig. 322** is one inch less than **Fig. 312**. *The cipher words apply to **Fig. 312**. When **Fig. 322** is wanted, add the word "Inside" to cipher word.

Figs. 312 and 322, 14 inches long, with "B" Plunger.

Size.	Fitted for Pipe.	Iron Attachments and Follower, Brass Cage and Valve.		Iron Attachments and all Brass Plunger.		All Brass.	
		*Cipher.	Price.	*Cipher.	Price.	*Cipher.	Price.
2 x14	1 inch.	Chiefly	$ 8.50	Chivalry	$ 9.75	Christen	$11.25
2¼x14	1¼ "	Chieftain	9.00	Chloral	10.25	Christian	11.75
2½x14	1¼ "	Childish	9.25	Chloride	10.50	Christmas	12.00
2¾x14	1¼ "	Childless	9.75	Chocolate	11.25	Chromatic	13.00
3 x14	1¼ "	Chilly	10.25	Choker	11.75	Chronic	13.50
3¼x14	1¼ "	Chimney	11.00	Cholera	12.75	Chronicle	14.50
3½x14	1½ "	Chinese	12.25	Chosen	14.75	Chrysalis	16.25
4 x14	2 "	Chintz	15.75	Chopper	19.00	Chunky	21.50
4½x14	2 "	Chipper	18.00	Choral	23.00	Church	26.00
5 x14	2½ "	Chiropod	20.50	Chorus	26.50	Churchman	30.50
6 x14	3 "	Chisel	24 00	Chowder	34.00	Churlish	40.00

N. B.—**Fig. 312**, 14 inches long, has 8 inch stroke. The stroke of **Fig. 322** is one inch less. *The cipher words apply to **Fig. 312**. When **Fig. 322** is wanted, add the word "Inside" to cipher word.

Figs. 312 and 322, 16 inches long, with "C" Plunger.

Size.	Fitted for Pipe.	Iron Attachments and Follower, Brass Cage and Valve.		Iron Attachments and all Brass Plunger.		All Brass.	
		*Cipher.	Price.	*Cipher.	Price.	*Cipher.	Price.
1¾x16	1 inch.	Churn	$ 9.00	Circumspect	$10·50	Claret	$12.00
2 x16	1 "	Churned	9.00	Circumvent	10.50	Clarify	12.00
2¼x16	1¼ "	Churning	9.75	Citadel	11.25	Clarion	12.75
2½x16	1¼ "	Cicerone	10.25	Citation	11.75	Clarionet	13.25
2¾x16	1¼ "	Cider	10.75	Citizen	12.25	Clasped	13.75
3 x16	1¼ "	Cigar	11.25	Citron	12.75	Classic	14.75
3¼x16	1¼ "	Cinchona	12.00	Civilian	14.00	Classify	16.00
3½x16	1½ "	Cinder	13.50	Civility	16.00	Clatter	18.50
4 x16	2 "	Cinnamon	17.50	Claimant	20.50	Cleanly	24 00
4½x16	2 "	Circuit	21.00	Claimer	26.50	Clearing	30.50
5 x16	2½ "	Circulate	24.00	Clamber	31.00	Cleavage	36.00
6 x16	3 "	Circumflex	30.00	Clammy	42.00	Clematis	49.00

N. B.—**Fig. 312**, 16 inches long has 8 inch stroke. The stroke of **Fig. 322** is one inch less. *The cipher words apply to **Fig. 312**. When **Fig. 322** is wanted, add the word "Inside" to cipher word. **Figs. 312** and **322**, 18 and 20 inches long, are listed on the next page.

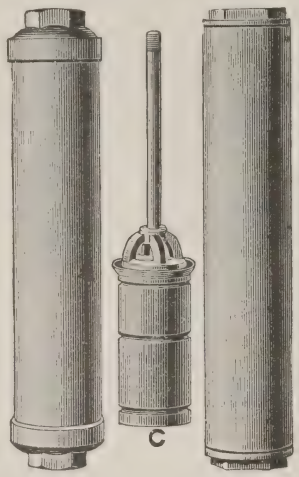
Seamless Brass Tube Cylinders.

FOR DEEP WELLS.

Figs. 312 and 322, 18 and 20 inches long, with "C" Plunger.

FIG. 312. **FIG. 322.**

18 and 20 inches long.



Size.	* Fitted for Pipe	Stroke.	Iron Attachments and Follower, Brass Cage and Valve.		Iron Attachments and All Brass Plunger.		All Brass.	
			Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1½x18	1 in.	10 in.	Commoner	$ 9.50	Consume	$11.25	Continuous	$12.75
1¾x18	1 "	10 "	Commonly	9.50	Consumed	11.25	Contorted	12.75
2 x18	1 "	10 "	Commotion	9.50	Consuming	11.25	Contortion	12.75
2¼x18	1¼ "	10 "	Communist	10.50	Consumptive	12.25	Contour	13.75
2½x18	1¼ "	10 "	Community	11.25	Contact	12 75	Contraband	14.50
2¾x18	1¼ "	10 "	Commutable	11.75	Contagion	13.25	Contraction	15.25
3 x18	1¼ "	10 "	Commute	12.25	Contain	13.75	Contradict	16.00
3¼x18	1¼ "	10 "	Companion	13.00	Contained	15.25	Contradicted	18.00
3½x18	1½ "	10 "	Compare	14.75	Containing	17.25	Contralto	20.75
4 x18	2 "	10 "	Comparing	19.25	Contempt	22.00	Contrarily	26.50
1½x20	1 "	12 "	Commit	10.00	Contend	12.00	Contrary	13.50
1¾x20	1 "	12 "	Commodity	10.00	Contended	12.00	Contrast	13.50
2 x20	1 "	12 "	Commodore	10.00	Contending	12 00	Contrasted	13.50
2¼x20	1¼ "	12 "	Constrain	11.25	Contention	13.25	Contrasting	14.75
2½x20	1¼ "	12 "	Constrained	12.25	Contest	13.75	Contribute	15.75
2¾x20	1¼ "	12 "	Constraining	12.75	Contestant	14.25	Contributor	16.75
3 x20	1¼ "	12 "	Constraint	13.25	Context	14.75	Contrite	17.25
3¼x20	1¼ "	12 "	Construct	14.00	Contiguous	16.50	Contrition	20.00
3½x20	1½ "	12 "	Construe	15.50	Continence	18 00	Contrivance	23.00
4 x20	2 "	12 "	Consular	21.00	Continue	23.50	Contriving	29.00
4½x22	2½ "	14 "	Consulate	30.00	Contingency	34.00	Control	40.00
5 x22	3 "	14 "	Consulted	36.00	Contingent	40.00	Controlling	48 00

N. B.—Above cipher words refer to **Fig. 312.** When **Fig. 322** is wanted, add "Inside" to cipher word.

SPECIAL

Deep Well Brass Cylinder.

WITH METALLIC VALVES.

Fig. 315, 16, 20 and 30 inches long, with "C" Plunger.

FIG. 315.

These Cylinders are made of heavy seamless-drawn brass tubing, and are metallic fitted throughout, making them especially adapted for deep wells that contain alkali and other substances that would affect iron or leather. They are suitable for deep wells and mines, and can be used in connection with our Pump Heads, **Figs. 432, 433, 435, and 436.** The cut shows Cylinder with inside attachments for drilled wells. We can furnish them with outside attachments or caps, if preferred.

Sizes.	* Fitted for Pipe	Length of Stroke.	Capacity per Stroke.	Cipher.	Price.
2 x 16	1 inch.	8 inches.	.11 gallons.	Clemency	$13.00
2½ x 16	1¼ "	8 "	.17 "	Clergy	14.50
3 x 16	1¼ "	8 "	.24 "	Clergyman	16.50
3½ x 16	1½ "	8 "	.33 "	Clerical	20.00
4 x 16	2 "	8 "	.44 "	Clerkship	26.00
4½ x 16	2 "	8 "	.55 "	Cleverly	33.00
5 x 16	2½ "	8 "	.68 "	Climate	40.00
2 x 20	1 "	10 "	.14 "	Climatic	16.00
2½ x 20	1¼ "	10 "	.21 "	Climber	17.50
3 x 20	1¼ "	10 "	.31 "	Clinic	20.00
3½ x 20	1½ "	10 "	.42 "	Clipping	24.00
4 x 20	2 "	10 "	.54 "	Cloddy	31.00
4½ x 20	2 "	10 "	.69 "	Cloister	40.00
5 x 20	2½ "	10 "	.85 "	Closely	50.00
3 x 30	1½ "	16 "	.49 "	Closeted	50.00
3½ x 30	2 "	16 "	.67 "	Clothier	55.00
4 x 30	2 "	16 "	.87 "	Cloudless	60.00
4½ x 30	2½ "	16 "	1.02 "	Clover	67.50
5 x 30	3 "	16 "	1.36 "	Clown	75.00
6 x 30	3½ "	16 "	1.96 "	Clumsy	90.00

* Fitted for other sizes of Pipe when so ordered; but we recommend sizes of Pipe as listed.

N. B.—Outside diameters of all styles and sizes of Cylinders are given on page 77.

SPECIAL

Artesian Well Brass Cylinders.

WITH BRASS-BALL VALVES.

FIG. 314. WITH WATER-PACKED PLUNGER.

The Cylinders, or Working Barrels, represented by the annexed cuts, are made of heavy seamless-drawn brass tubing, and are perfectly smooth and true. The inside diameter of the Cylinder is smaller than that of the pipe, or casing, with which it is used. This admits of removing the valves by drawing them up through the Cylinder and well pipe (or casing), which is often a great convenience when repairs are necessary. The lower end of the Cylinder is threaded for pipe, so that a strainer, or well point, may be attached and set in bottom of the well.

FIG. 324. WITH LEATHER-PACKED PLUNGER.

The cuts represent these Cylinders with different styles of Plungers, **Fig. 314** with Water packing grooves, and **Fig. 324** with Leather packing, both furnished at the same price.

The Ball Valves of these Cylinders are made of the hardest brass, or gun metal.

These Cylinders are adapted to very deep wells. With suitable power they may be used in wells up to 2,000 feet in depth.

In connection with the price-list we give, for convenience in ordering, the inside diameter of Cylinder; the size of well pipe (or casing); the length of Cylinder; the length of stroke; also the capacity in gallons per stroke, from which the capacity for any given time can be obtained by the number of strokes per minute the Pump is worked.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

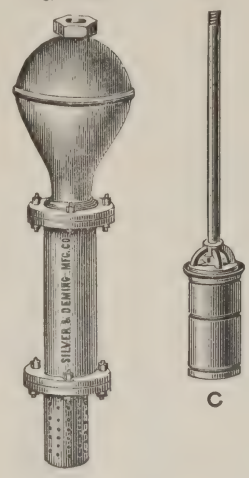
Inside Diameter of Cylinder.	Inside Diameter of Pipe or Casing	Length of Cylinder.	Length of Stroke.	Capacity in Gallons per Stroke.	*Cipher.	Price.
1⅜ inch.	1½ inch.	32 inch.	16 inch.	.10	Collator	$ 15.00
1¾ "	2 "	32 "	16 "	.15	Colleague	18.00
2¼ "	2½ "	32 "	16 "	.25	Collegian	24.00
2¾ "	3 "	32 "	16 "	.38	Collide	32.00
3¼ "	3½ "	36 "	16 "	.54	Colliery	50.00
2¾ "	3 "	48 "	24 "	.57	Collodion	38 00
3¼ "	3½ "	48 "	24 "	.81	Collude	55 00
3¾ "	4 "	48 "	24 "	1.15	Collusion	65.00
4¼ "	4½ "	48 "	24 "	1.47	Cologne	75.00
4¾ "	5 "	48 "	24 "	1.84	Colonial	86.00
2¾ "	3 "	54 "	30 "	.71	Columbine	45 00
3¼ "	3½ "	54 "	30 "	1.01	Comatose	60.00
3¾ "	4 "	54 "	30 "	1.44	Combat	65.00
4¼ "	4½ "	54 "	30 "	1.84	Combined	85.00
4¾ "	5 "	54 "	30 "	2.30	Combing	100.00
5¾ "	6 "	54 "	30 "	3.37	Comedian	115.00
3¼ "	3½ "	60 "	36 "	1.21	Comedy	70.00
3¾ "	4 "	60 "	36 "	1.71	Comfort	90.00
4¼ "	4½ "	60 "	36 "	2.20	Comical	100.00
4¾ "	5 "	60 "	36 "	2.76	Comma	125 00
5¾ "	6 "	60 "	36 "	4.04	Commander	150.00
3¾ "	4 "	66 "	42 "	1.99	Comment	100.00
4¼ "	4½ "	66 "	42 "	2.57	Commentary	115.00
4¾ "	5 "	66 "	42 "	3.22	Commit	130.00
5¾ "	6 "	66 "	42 "	4.70	Committee	180.00

* The Cipher words in the above price list apply to **Fig. 314.** When **Fig. 324** is wanted, add the word "Leather" to the Cipher word.

Illustrations and lists of Leather-Packed Plungers and Lower Valves only, for Oil and Artesian Wells, will be found on pages 86 and 87. They are designated as **Fig. 374.**

N. B.—Outside diameters of all styles and sizes of Cylinders are given on page 77.

FIG. 316.



Deep Well Cylinder.

WITH AIR CHAMBER AND STRAINER.

Fig. 316, with "C" Plunger.

These Cylinders may be used in any depth of well in connection with a suitable Well Force Pump Standard. The Air Chamber facilitates the working of the Pump.

Sizes and Prices.

Size.	* Fitted for Pipe	IRON.		BRASS BODY AND PLUNGER.	
		Cipher.	Price.	Cipher.	Price.
2¾ x 16	1¼ inch	Cluster	$10.00	Coaster	$15.00
3 x 16	1¼ "	Coachman	10.50	Coasting	16 00
3¼ x 16	1¼ "	Coactive	11.00	Coaxing	17.50
3½ x 16	1½ "	Coadjust	11.50	Cobalt	19.00
3¾ x 16	1½ "	Coadjutor	12.00	Cobaltic	21.00
4 x 16	2 "	Coagulate	13.00	Cobbler	23.00

Wood Pump Cylinder.

Fig. 318, with "G" Plunger.

FIG. 318

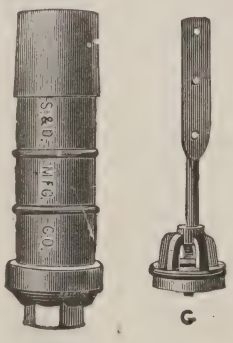


Fig. 318 Cylinders are much used in connection with Wood Pumps on Driven Wells.

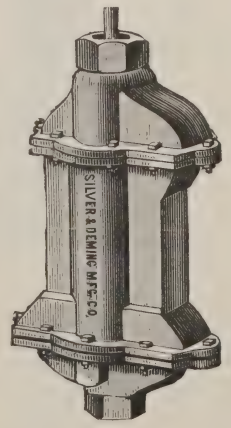
Sizes and Prices.

Size.	* Fitted for Pipe	IRON.		BRASS VALVE SEAT AND SPRING VALVE.	
		Cipher.	Price.	Cipher.	Price.
3 x 12	1¼ inch	Cobweb	$3.00	Cockswain	$3 50
3¼ x 12	1¼ "	Cockade	3.50	Cocoa	4 00
3½ x 12	1½ "	Cockle	4 00	Cocoon	4.50
4 x 12	2 "	Cockney	4.50	Coercion	5.00

Double-Acting Cylinder.

Fig. 319, with "H" Plunger.

FIG. 319.



These Cylinders are very desirable for Shallow Wells; also for Deep Wells where plenty of power is obtainable.

Sizes and Prices.

Size Cylinder.	* Fitted for Pipe	Stroke.	Cipher.	Price.
2¼ inch.	1¼ inch.	6 inch.	Coffee	$10 00
3 "	1½ "	6 "	Cogent	12.00
4 "	2 "	6 "	Cogency	14.00

* Fitted for other sizes of Pipe when so ordered; but we recommend the use of Pipe according to sizes as listed.

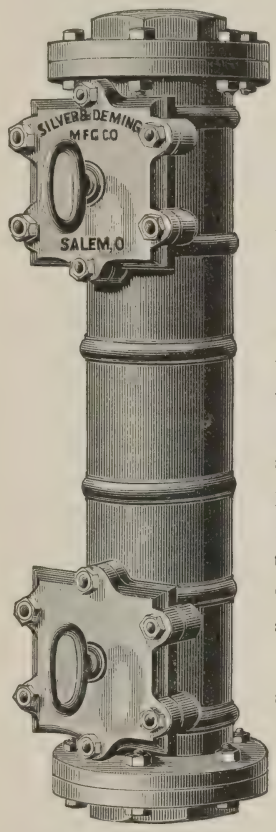
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

N. B.—Outside diameters of Cylinders are given on page 77.

IMPROVED
Cornish Mine Pump Cylinders.

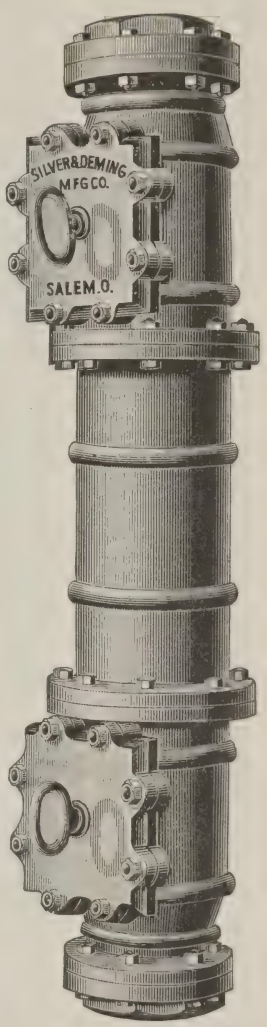
FOR MINES, DEEP WELLS, QUARRIES ETC.

FIG. 345.



The cuts on this page represent **Fig. 345**, our Cornish Mine Pump Cylinders. The two styles of Cylinders are identical in construction, except that those five and six inches in diameter are made as represented by the smaller cut, and those eight and ten inches in diameter are made with the valve box and face plates as shown in the larger cut. In these Cylinders, the valves may be removed for repairs without taking out the Cylinder. They are used in mines, and in deep open wells, in quarries, and other places where they can be submerged. No priming is required when the working parts are in the water, which makes them less liable to get out of order than if the Cylinder is placed above the water. The Working Heads to be used with these Cylinders are **Figs. 435, 436**, Power Working Heads, and **Fig. 438**, Steam Pump Head.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

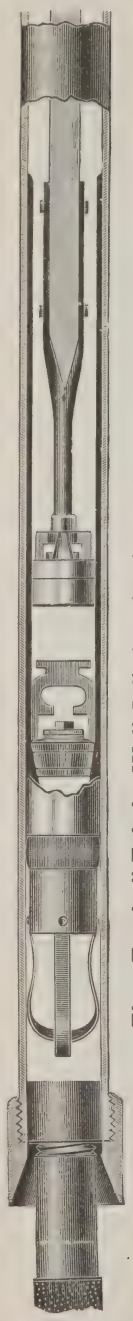


Sizes and Prices.

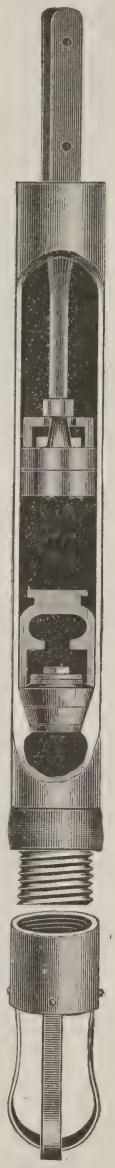
Diameter Cylinder.	*Suction and Discharge.	Length of Stroke.	Capacity per Stroke.	Cipher.	Price
5 inch.	3 inch.	14 inch.	1.2 Gallons.	Cognition	$ 60 00
6 "	4 "	14 "	1.7 "	Cognomen	75 00
8 "	5 "	16 "	3.5 "	Cohere	100 00
8 "	5 "	18 "	4.0 "	Coherent	110.00
10 "	6 "	15 "	5.1 "	Coinage	125 00
10 "	6 "	18 "	6.13 "	Colander	135 00
10 "	6 "	20 "	6.8 "	Collation	150.00

*We can fit these Cylinders for other sizes of Pipe when especially ordered; but we recommend them to be fitted as listed.

Tubular Well Cylinders, Valves, Etc.

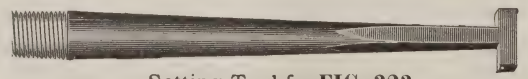


The "Eureka" Tubular Well Cylinder, showing Cylinder in Well or Pipe.



Dog Coupling—**FIG. 323.**

Showing "Eureka" Cylinder as Furnished.—**FIG. 323.**

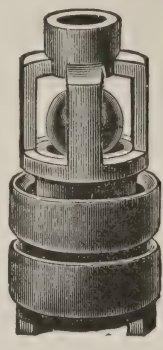


Setting Tool for **FIG. 323.**

Artesian Well Wrought-iron Wood-rod Coupling.—**FIG. 636.**

Wrought-iron Tubular Well Cylinder.—**FIG. 346.**

FIG. 635.
Malleable Wood-rod Coupling.



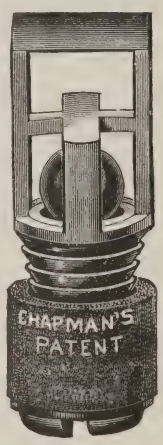
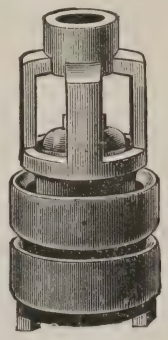


FIG. 375-B.—Chapman Valves, Standard Pattern.—**FIG. 375-A.**



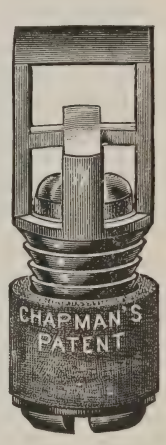


FIG. 376-B.—Chapman Valves, New Pattern.—**FIG. 376-A.**

Artesian Well Lower Valve—**FIG. 374-B.**

Artesian Well Plunger Valve—**FIG. 374-A.**

THE "EUREKA"

Tubular Well Brass Cylinder.

FIG. 323.

This Cylinder, represented by cuts on the preceding page, is made of Seamless-drawn Brass Tubing, with suitable Valves and Wood-rod Coupling complete. It is set in place after the well is made, using the Setting Tool attached to the drill rod to crowd it down to its place. The Dog Spring Coupling holds firmly to the walls of the Well (the inside of the pipe or casing), while the Cylinder proper is revolved by the Setting Tool as it screws down on the coupling, expanding the rubber packing between the Cylinder and coupling and locking it to the Pipe. It may be attached to the Filter Point in the same manner. The Valves are more easily taken out for repairs and re-set than any style of Tubular Well Valves ever invented. The "Eureka" Cylinders are fully covered by *valid patents.*

Sizes and Prices.

*Size	For Pipe or Casing.	Stroke.	WITHOUT DOG SPRING COUPLING.		WITH DOG SPRING COUPLING.	
			Cipher.	Price.	Cipher.	Price
2 inch.	2 inch.	12 inches.	Tactics	$10.00	Tasteless	$11.50
2½ "	2½ "	12 "	Tainted	17.00	Teacher	18.50
3 "	3 "	15 "	Talent	27.50	Tedious	29.50
4 "	4 "	18 "	Tarnish	50.00	Temerity	56.00
5 "	5 "	18 "	Tartness	70.00	Tempest	78.00

*The "size" means the size (inside diameter) of Pipe or Casing these Cylinders are suited for.
Setting Tool for **Fig. 323**, $2.50. Special sizes of **Fig. 323** made to order.

Wrought-Iron Tubular Well Cylinder.

FIG. 346.

Size (for Pipe).	Length.	BORED AND POLISHED CYLINDER.		BRASS-LINED CYLINDER.	
		Cipher.	Price.	Cipher.	Price.
2 inch.	48 inches.	Temporal	$10.00	Tendency	$15 00
2½ "	48 "	Tenable	14.00	Tenderly	20.00
3 "	48 "	Tenacity	20.00	Terrible	30.00

Fig. 346 Cylinders are provided with *Steel Shoe.*
N. B.—Strainer Well Points are listed on pages 176 and 177.

Chapman's Tubular Well Valves.

FIGS. 375 and 376.

DIAMETER, IN INCHES, OF CYLINDER OR PIPE.	2	2½	3
Figs. 375 A and 375 B—Chapman's Standard Pattern Tube Well Valves (with Gutta Percha Ball Valves), per set	$6.00	$9.00	$12.00
Figs. 376 A and 376 B—Chapman's New Pattern Tube Well Valves (with Brass Clapper Valves), per set	6.00	9.00	12.00
Figs. 375 B or 376 B—Check Valves only, each	3.50	5.25	7.00
Figs. 375 A or 376 A—Plunger Valves only, each	2.50	3 75	5.00

Oil and Artesian Well Valves.

FIG. 374.

Diam. Cylinder.	Price Plunger-A.	Price Lower Valve-B.	Price per set.	Diam. Cylinder.	Price Plunger-A.	Price Lower Valve-B.	Price per set.
1⅜ inch.	$ 5.00	$ 2.25	$ 7.25	3¼ inch.	$25.00	$14.00	$39.00
1¾ "	6.25	2.75	9.00	4¼ "	30.00	18.00	48.00
2¼ "	7.00	5.25	12.25	4¾ "	42.00	22.00	64.00
2¾ "	8.50	8.00	16.75	5¾ "	46.00	26.00	72.00
3¼ "	15.00	12.50	27.50				

Tubular and Artesian Well Rod Couplings.

Fig.	Couplings adapted for	Malleable.	Galvanized.	Wrought-Iron.
635	Tubular Well Wood Rod (1 inch)	40 cts. per pair.	60 cts. per pair.	
636	Oil or Artesian Well Wood Rod (1⅝ in.)			$1.75 per pair.

Check and Foot Valves.

FIG. 331.—Foot Valve.

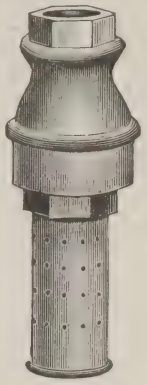


FIG. 328.—Foot Valve.

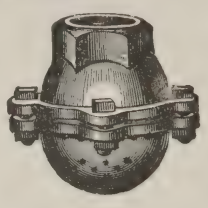


FIG. 327.—Foot Valve.

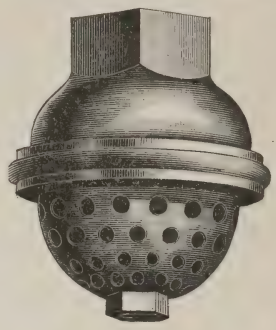


FIG. 326.—Horizontal Check Valve.

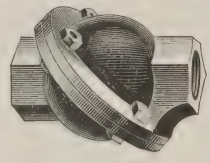
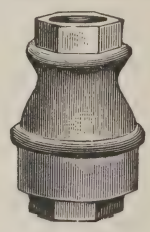


FIG. 329.—Foot Valve.

FIG. 325.—Check Valve.

FIG. 330.—Check Valve.



Sizes and Prices.

SIZES IN INCHES.	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10
Fig. 331	$1.75	$2.00	$2.25	$2.50	$3.00	$3.50	$4.50	$ . .	$ . .	$ . .	$ . .	$ . .	$ . .
Fig. 330	1.75	2.00	2.25	2.50	3.00	3.50	4.50	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 327 Iron	. . .	1.25	1.50	1.75	2.25	2.75	3.75	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 327 Galvanized	. . .	1.50	1.75	2.25	2.75	3.25	4.25	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 327 Brass	. . .	2.75	3.50	4 25	5.00	6 00	7.00	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 328 Iron	1.25	1.25	1.50	1.75	2.25	2.75	4.00	7.50	10.00	13 00	24.00	40.00	72.00
Fig. 328 Galvanized	1.50	1.50	1.75	2.25	2.75	3.25	4.50	9.00	12.00	15 00	30.00	60.00	120.00
Fig. 325	1.50	1.75	2.00	2.50	3 00	4.25	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 329	1.25	1.25	1.50	1.75	2.25	2.75	4.00	7.50	10.00	13.00	24.00	40.00	72.00
Fig. 326	1.00	1.25	1.50	2.00	2.75	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .

Pump Fixtures.

FIG. 396.
Wind Mill Connection.

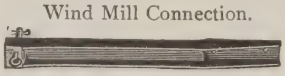


FIG. 343.—Handle Ball.

FIG. 359.
Guide Pipe Coupling.

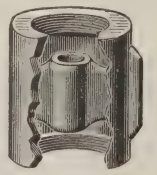


FIG. 634.—Rod Coupling.

Fig. 343.	Weight.	2¾	4½	6	8	12½
	Price.	$0.30	$0.45	$0 60	$0.80	$1.25
Fig. 359.	Size.	1¼	1½	2	2½	3
	Price.	$0.75	$1.00	$1.25	$2.00	$2.75
Fig 634.	Fitted for Rod.		⅜	7/16	⅜x7/16	
	Threads to inch.		14	12	14x12	
	Malleable, per lb.		$ 0.40	$ 0.40	$ 0.40	
	Galvanized, "		.60	.60	.60	
	Brass, "		1.00	1.00	1.00	
Fig. 396.	Wind Mill Connecting Slide, each, 50 cts.					

Suction Strainers.

FIG. 336.

FIG. 338.

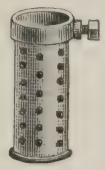


FIG. 339.

FIG. 340.

FIG. 337.

FIG. 341.

Sizes and Prices.

SIZE IN INCHES.		1	1¼	1½	2	2½	3	3½	4	5	6
Fig. 336, for Pipe,	Plain	$0.70	$0.75	$0.90	$1.15	$1.25	$ . .	$ . .	$ . .	$ . .	$ . .
	Galvanized	.90	.95	1.05	1.40	1.60	. . .	. . .	. . .	. . .	. . .
Fig. 338, for Pipe,	Plain	.40	.50	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
	Gauze Covered	.70	.80	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 339, for Pipe,	Plain	.50	.60	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
	Gauze Covered	.80	.90	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 340, for Pipe,	Plain	.50	.60	.70	.90	1.15	1.40	. . .	. . .	. . .	. . .
	Gauze Covered	.80	.90	1.00	1.25	. . .	. . .	. . .	. . .	. . .	. . .
Fig. 341, for Pipe,	Plain	.50	.60	.70	.90	1.25	1.75	2.50	3.25	4.25	5.50
	Galvanized	.80	.90	1.00	1.25	1.75	2.50	3.50	4.50	5.75	7.50
Fig. 337, for Hose,	Plain	. . .	.50	.65	1.00	1.50	. . .	. . .	. . .	. . .	. . .
	Galvanized	. . .	.60	.75	1.25	1.90	. . .	. . .	. . .	. . .	. . .
	Brass	. . .	2.25	2.75	3.50	5.00	. . .	. . .	. . .	. . .	. . .

Wind Mill Tank Valves.

FIG. 351.

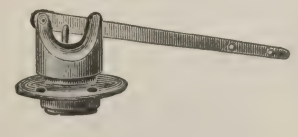


FIG. 354.

FIG. 350.

FIG. 353.

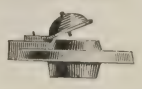
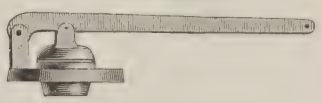


FIG. 352.



Sizes and Prices.

SIZES IN INCHES, of Pipe for which they are fitted.	¾	1	1¼	1½
Fig. 350, Float Valve, each	$0.80	$0.80	$1.00	$ . .
Fig. 351, Float Valve, each	.80	.80	1.00	. .
Fig. 352, Tank Outlet Valve, each	.80	.80	1.00	1.25
Fig. 353, Tank Check Valve, each	.75	.75	.90	1.00
Fig. 354, Vertical Float Valve, each	1.00	1.00	1.25	. .

Force Pump Air Chambers.

FOR HAND AND HOUSE FORCE PUMPS.

FIG. 370.

FIG. 371.

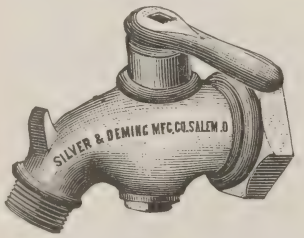
FIG. 372.

These cuts represent Air Chambers with different forms of discharge, which are used on our various styles of Hand and House Force Pumps, including **Figs. 500 to 512**, and **Figs. 520, 521, 522,** and **526.** We furnish them with the holes drilled so they may be bolted, without extra fitting, to any of the Pumps to which they are suited. They are always fitted with four holes in the flange, unless otherwise ordered. Fitted for 1¼, 1½, or 2 inch discharge; but always for 1¼ inch, unless otherwise specified.

PRICES.

Fig. 370.	Cipher.	Price.	Fig. 371.	Cipher.	Price.	Fig. 372.	Cipher.	Price.
	Consonant	$2.00		Consort	$2.00		Conspire	$2.50

FIG. 360.



Force Pump Cock.

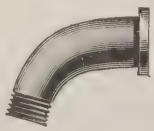
The annexed cut represents **Fig. 360,** a Cock used in connection with several styles of our Hand Force, Well and Wind Mill Pumps. It has an Iron Case and Brass Plug, and is fitted with right and left hand coupling nut.

Sizes and Prices.

No.	Size Cylinder Suited For	Fitted for Hose Coupling.	Cipher.	Price.
1	2 inch to 3¼ inch.	1 inch.	Constable	$ 2.00
2	3¼ " to 4 "	1¼ "	Constitute	2.50

Goose-Necks for Hose.

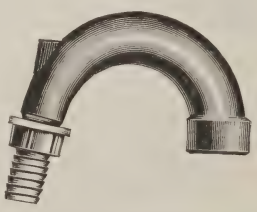
FIG. 361.—For Side Discharge.



The **Fig. 361** Goose-Necks, are suited to any of our Hand and House Force Pumps with Air Chamber, as shown above. They are fitted for hose coupling and the Air Chamber has coupling-nut for attaching to discharge of Pump.

The **Fig. 362** Goose-Necks, are threaded on both ends, and are used mostly with Wind Mill Force Pumps.

FIG. 362.—For Upward Discharge.



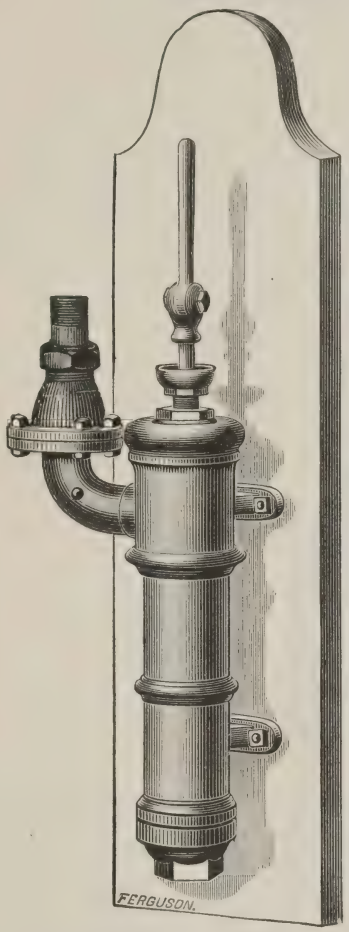
Sizes and Prices.

Size.	Fitted for Hose Coupling.	Fig. 361.		Fig. 362, without Hose Coupling.		Fig. 362, with Hose Coupling.	
		Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
¾	¾ inch.	. . . . .	. . . . .	Competent	$ 0.60	Compliment	$ 0.90
1	1 "	Compassion	$ 0.40	Compiler	.60	Component	1.25
1¼	1¼ "	Compatible	.50	Complacent	.80	Composer	1.50
1½	1½ "	Compeer	.60	Complex	.90	Comprehend	1.80
2	2 "	. . . . .	. . . . .	Complexity	1.00	Compulsion	2.50

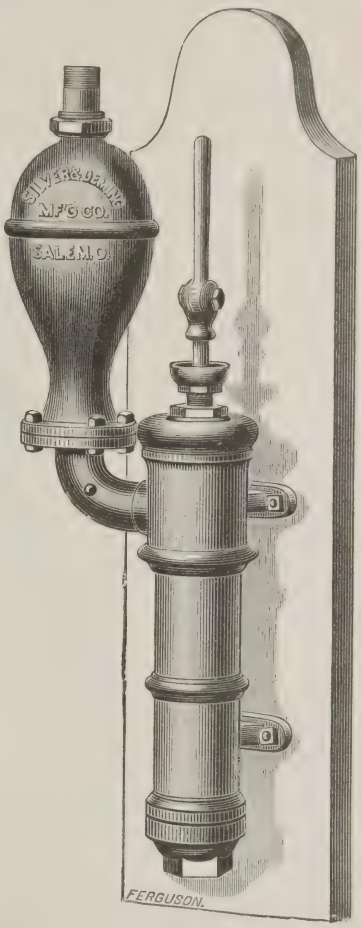
Special Power Force Pumps,

ON PLANK.

FIG. 500. **WITH PITMAN, FOR POWER.** **FIG. 501.**



FORKED ROD COUPLING.



The Pumps illustrated above are for Power or Wind Mill use. As listed they are arranged with pitman for any kind of power. When used in connection with a Wind Mill it is preferable to have the Forked Rod Coupling (as shown in cut) to which the Wood Rod of the Wind Mill is attached.

Where water must be forced to a great height, we recommend **Fig. 501**, with Air Chamber, since that is an assistance to the working of the Pump. These Pumps, to give satisfactory results, should not be placed more than twenty-five feet above the water.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	FIGURE 500.				FIGURE 501.			
				Iron.		Brass.		Iron.		Brass.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	7 inch.	Empire	$ 7.50	Empty	$16.00	Emulate	$ 9.00	Emulsion	$18.00
2	2½ "	1¼ " "	7 "	Emporium	8 00	Emptier	18.00	Emulation	9.50	Enacted	20.00
3	3 "	1¼ " "	7 "	Empress	8.50	Emptiness	20.00	Emulator	10 00	Enactor	22.00

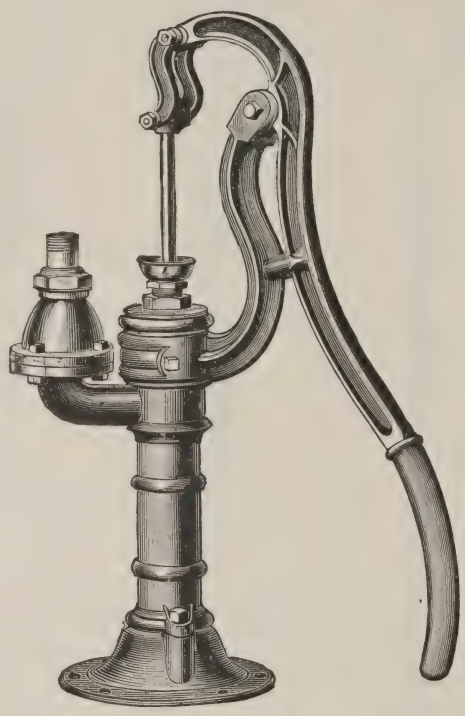
Forked Rod Coupling for Wind Mill attachment, as shown in cut, $1.50 extra list.

Improved Hand Force Pump,

ON BASE.

WITH ADJUSTABLE LEVER AND BRASS PISTON-ROD.

FIG. 502.



The Force Pump represented by the above cut is a style that is well known to the trade. The Cylinder or Working Barrel is in the stock of the Pump. It is provided with a substantial base, a brass piston-rod, and adjustable lever; and has a stuffing-box which gives it the power of forcing water. To facilitate its operation as a Force Pump for hand use, this style of Pump is provided with Air Chamber, etc., as shown on page 90, and illustrated in Figs. 504 to 512, on pages 94 to 102. This Pump is made with Brass Valve Seat and coupling below the base fitted for both Lead and Iron Pipe. All parts are made to exact guages, and repairs will always fit. To prevent freezing the lever should be raised to its extreme height, which trips the valves and allows the water to escape from the Cylinder. The Pump should be located a vertical distance from the water, not over twenty-five feet.

Rules and Tables for Capacity, Required Power and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Eager	$ 8.00	Earthen	$ 13.50	Easiness	$ 19.50
2	2½ "	1¼ " "	6 "	Eagerly	9.50	Earthly	14.00	Easter	21.00
3	3 "	1¼ " "	6 "	Earldom	11.00	Earthquake	15.00	Eatable	32 00
4	3½ "	1½ " "	8 "	Earnest	17.00	Earthwork	24.00	Ebonize	38.00
5	4 "	2 " "	8 "	Earnestly	18.00	Easel	30.00	Ebony	47.00

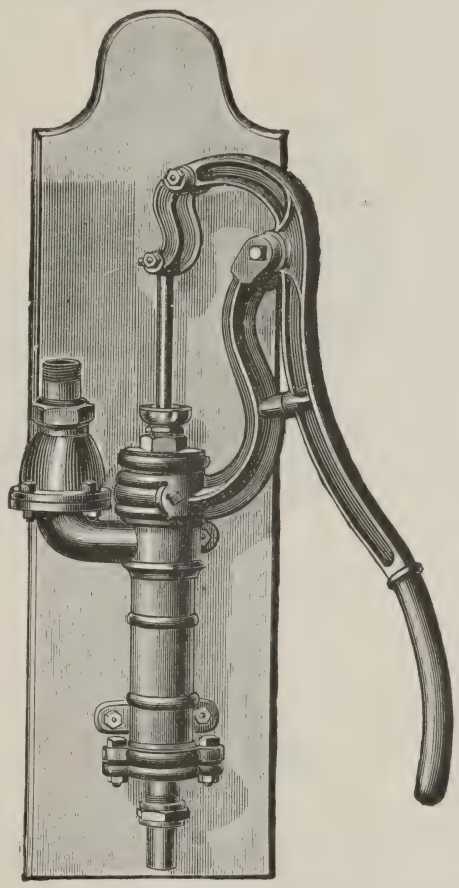
* The Brass Pumps are all Brass, except Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH ADJUSTABLE LEVER AND BRASS PISTON-ROD.

FIG. 503.



We show above a cut representing **Fig. 503**, a Force Pump, similar in every respect to Fig. 502, described on the preceding page, except in the matter of the brackets attaching it to a plank, and in the flange at the bottom of the Cylinder, which adapt this Pump for attaching to the wall.

It is arranged for both Lead and Iron Pipe, has a Brass Valve Seat, and is in every way well constructed. To prevent freezing, raise the lever to its extreme height.

In locating this Pump, it should not be placed more than twenty-five feet vertically from the water.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYL.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Ebrious	$ 8.00	Echo	$13.50	Eclectic	$19.50
2	2½ "	1¼ " "	6 "	Ebulition	9.50	Echoed	14.00	Ecliptic	21.00
3	3 "	1¼ " "	6 "	Eccentric	11.00	Echoing	15.00	Economic	32.00
4	3½ "	1½ " "	8 "	Ecclesiast	17.00	Echoless	24.00	Economy	38.00
5	4 "	2 " "	8 "	Echinus	18.00	Eclat	30.00	Ecstasy	47.00

*The Brass Pumps are all Brass, except Lever, Fulcrum and Base.

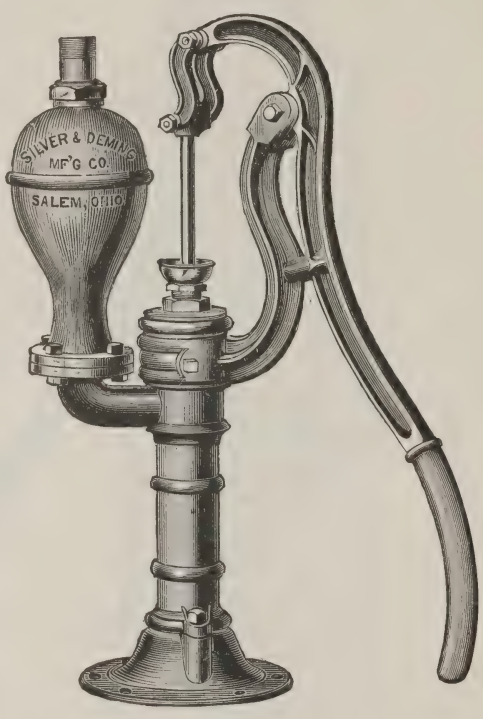
Improved Hand Force Pump,

ON BASE.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD.

UPWARD DISCHARGE.

FIG. 504.



The above cut represents a Hand Force Pump, similar to **Fig. 502,** with the addition of an Air Chamber with upward discharge.

Fig. 504 is arranged for both Lead and Iron Pipe. In all its working parts it is the same as **Fig. 502** and **503.** Freezing may be prevented by raising the lever to its extreme height. The Cylinder of the Pump should not be more than twenty-five feet vertically from the water. This Pump is very convenient for tank use, and is largely used by plumbers, as are also **Figs. 505, 506, 507, 508, and 509,** on following pages.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch	Ecstatic	$ 8.50	Edging	$ 14.00	Editor	$ 19.50
2	2½ "	1¼ " "	6 "	Eddy	10.00	Edible	15.00	Editress	22.00
3	3 "	1¼ " "	6 "	Eden	12.00	Edict	16.00	Educate	33.00
4	3½ "	1½ " "	8 "	Edgeless	18.00	Edifice	26.00	Educe	40.00
5	4 "	2 " "	8 "	Edgewise	21.00	Edify	32.00	Eduction	49.00

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD. UPWARD DISCHARGE.

FIG. 505.

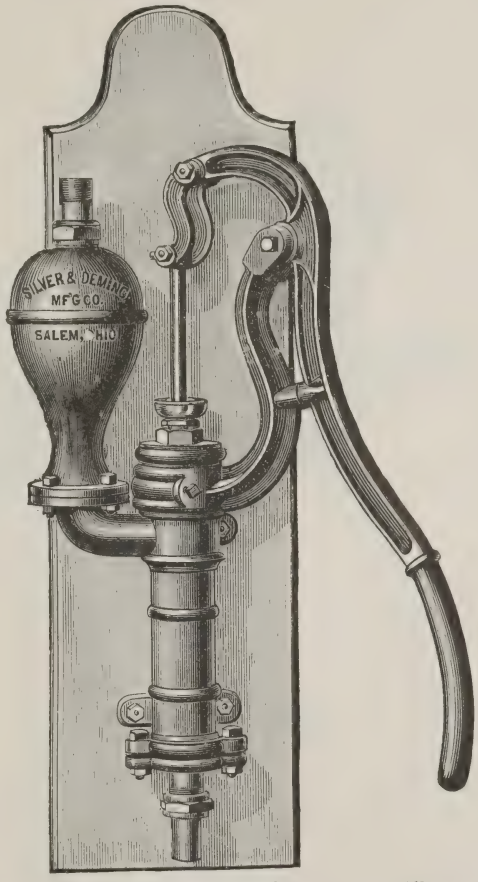


Fig. 505, illustrated above, is similar to **Fig. 504,** in its essential parts; the difference being in the plank to which the Pump is fastened by means of a pair of brackets. The flange at bottom of the Cylinder takes place of the base in **Fig. 504,** and holds the suction pipe coupling, which is arranged for both Lead and Iron Pipe, as in **Fig. 504.** To prevent freezing, raise the lever to its extreme height. The Pump should not be located more than twenty-five feet above the water to insure its successful operation.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Effable	$ 8.50	Efflate	$ 14.00	Effused	$ 19.50
2	2½ "	1¼ " "	6 "	Effaced	10.00	Efflux	15.00	Effusion	22.00
3	3 "	1¼ " "	6 "	Effectual	12.00	Effort	16.00	Eggnog	33.00
4	3½ "	1½ " "	8 "	Effervesce	18.00	Effulge	26.00	Eglantine	40.00
5	4 "	2 " "	8 "	Effigy	21.00	Effuse	32.00	Egotism	49.00

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

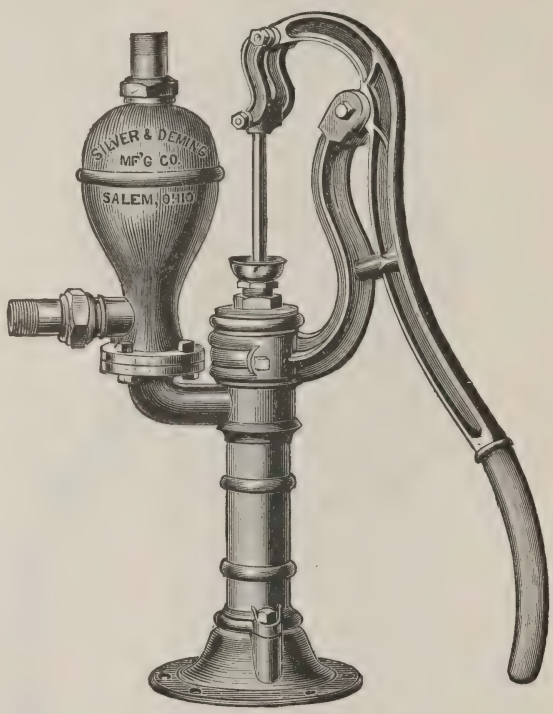
Improved Hand Force Pump,

ON BASE.

WITH AIR CHAMBER, ADJUSTABLE LEVER AND BRASS PISTON-ROD.

DOUBLE DISCHARGE.

FIG. 506.



This Pump is precisely the same as **Fig. 504**, with the addition of a side discharge on the Air Chamber. The advantage over the preceding Pumps of this class is in the ability to arrange **Fig. 506** for discharging upward into a tank or in another direction through the side discharge; a brass service cock being used to shut off the water from either discharge when using the other. Freezing is prevented by raising the lever to its extreme height, which trips the valves and allows the water to flow back from the working barrel. The Pump should not be located over twenty-five feet above the water. Arranged for both Lead and Iron Pipe.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYL.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Egotist	$ 10.00	Eject	$ 15.00	Elapse	$ 20.50
2	2½ "	1¼ " "	6 "	Egotize	11.00	Ejection	16.00	Elastic	22.50
3	3 "	1¼ " "	6 "	Egregious	13.00	Elaborate	18.00	Elate	33.50
4	3½ "	1½ " "	8 "	Egress	19.00	Elaine	27.00	Elated	41.00
5	4 "	2 " "	8 "	Egyptian	21.00	Eland	33.00	Elation	50.00

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD. DOUBLE DISCHARGE.

FIG. 507.

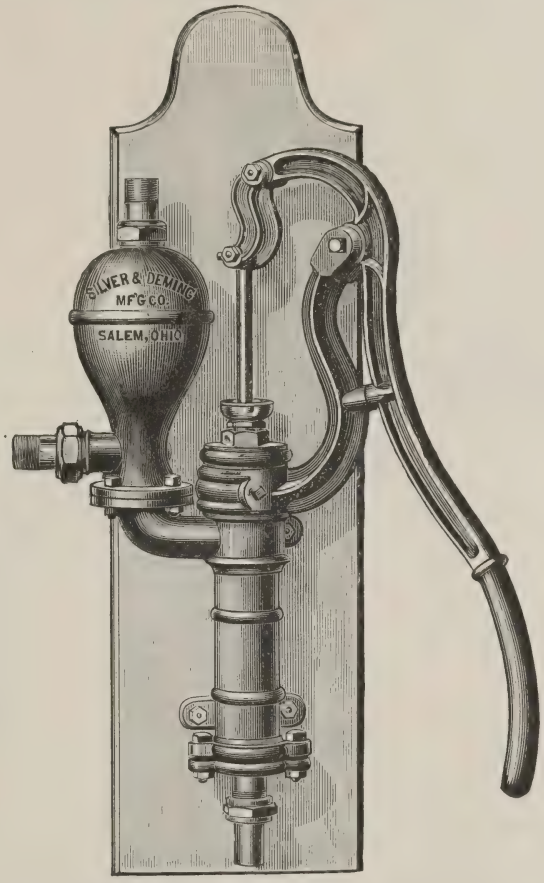


Fig. 507, represented by the above engraving, is similar to **Fig. 506,** and is adapted to the same conditions in pumping. It dispenses, however, with the base, for which a flange is substituted, and to this the Lead and Iron Pipe coupling is attached. It is secured to a plank by means of brackets.

This style of Pump is preferable to a Pump with base, where it is convenient to attach it to a wall or post, as it thus occupies a comparatively small space. **Fig. 507** is like **Fig. 505,** with the addition of a side discharge on the Air Chamber. To prevent action of the frost, raise the lever to its extreme height. These Pumps will not raise water vertically by suction more than about twenty-five feet.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Elder	$10.00	Electing	$15.00	Elegance	$20.50
2	2½ "	1¼ " "	6 "	Elderly	11.00	Election	16.00	Elegant	22.50
3	3 "	1¼ " "	6 "	Eldest	13.00	Elective	18.00	Elegist	33.50
4	3½ "	1½ " "	8 "	Elect	19.00	Elector	27.00	Elegy	41.00
5	4 "	2 " "	8 "	Elected	21.00	Electoral	33.00	Element	50.00

*The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON BASE.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD.

UPWARD DISCHARGE AND COCK SPOUT.

FIG. 508.

The Pump illustrated above is the same as **Fig. 506**, with a cock spout on the side discharge. **Fig. 508** is adapted for use under the same conditions as **Figs. 506** and **507**, and will be found even more convenient than those Pumps. The spout of **Fig. 508** is threaded for hose coupling, which makes it very convenient for fire protection, and other purposes for which such a Pump may be used. For tank use, **Figs. 508** and **509** are in greater demand than any other of our Hand Force Pumps.

Freezing is prevented by raising the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Elfin	$11.00	Elided	$16.50	Elite	$22.00
2	2½ "	1¼ " "	6 "	Elfish	12.50	Eliding	18.00	Elixir	23.50
3	3 "	1¼ " "	6 "	Elicit	14.50	Eligible	19.50	Ellipses	35.00
4	3½ "	1½ " "	8 "	Elicited	21.50	Eliminate	29.50	Elliptic	43.50
5	4 "	2 " "	8 "	Elide	22.50	Elision	35.50	Elongate	52.50

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD. UPWARD DISCHARGE AND COCK SPOUT.

FIG. 509.

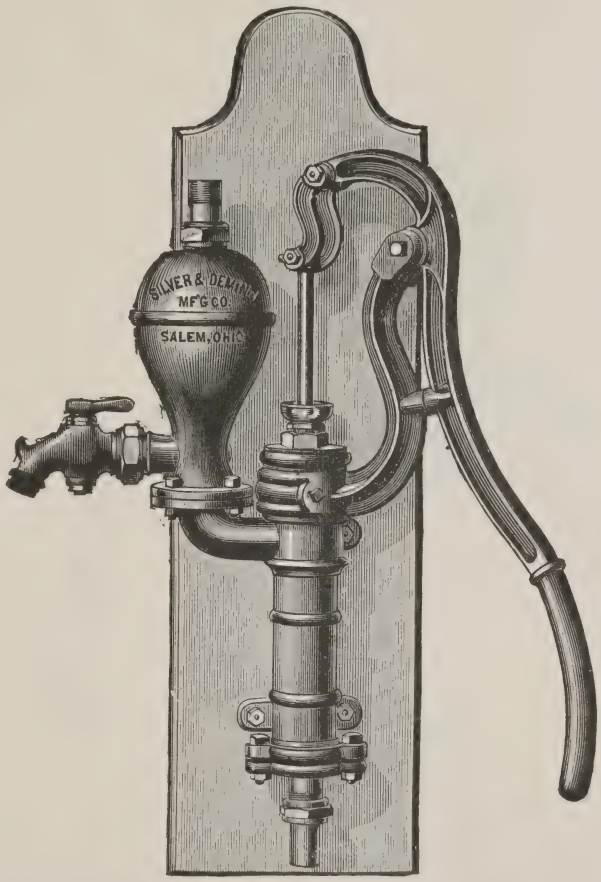


Fig. 509, illustrated by the above cut, is similar to **Fig. 507,** having a spout with cock in place of the side discharge, which adapts it for using hose. It differs only from **Fig. 508** by being placed on a plank instead of having a base. It has, in common with all the Hand Force Pumps of this class, a Brass Valve Seat and coupling for both Lead and Iron Pipe.

To prevent freezing, raise the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Elope	$11.00	Elude	$16.50	Emaciated	$22.00
2	2½ "	1¼ " "	6 "	Elopement	12.50	Eluding	18.00	Emanate	23.50
3	3 "	1¼ " "	6 "	Eloquence	14.50	Elusive	19.50	Embale	35.00
4	3½ "	1½ " "	8 "	Eloquent	21.50	Elusory	29.50	Embalm	43.50
5	4 "	2 " "	8 "	Elucidate	22.50	Elysian	35.50	Embargo	52.50

*The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

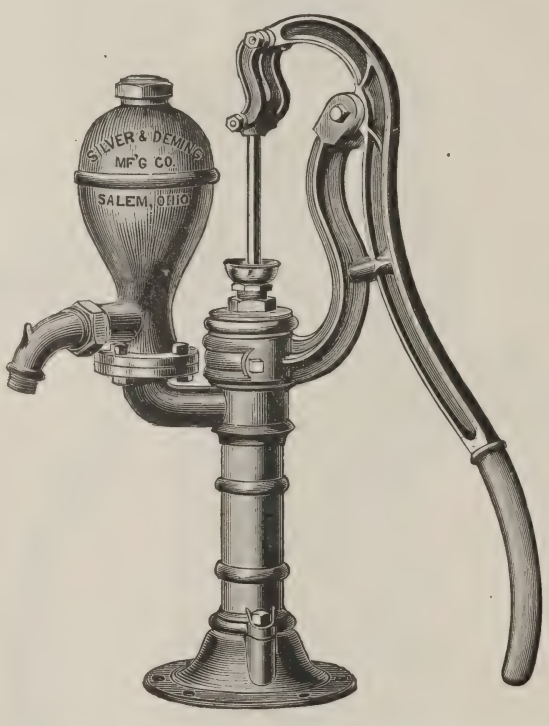
Improved Hand Force Pump,

ON BASE.

WITH AIR CHAMBER, ADJUSTABLE LEVER, AND BRASS PISTON-ROD.

WITH SPOUT AND TIGHT CAP.

FIG. 510.



This Pump is similar to **Fig. 508**, in that it is provided with a spout threaded for hose coupling on side discharge; the spout, however, is without a stop cock, as in **Fig. 508**; and a tight cap is placed on the upward discharge. If desirable to use the upward discharge, the spout can be removed and the cap placed on side discharge. This Pump is adapted for both Lead and Iron Pipe, and is provided with Brass Valve Seat. To prevent freezing, the lever should be raised to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Embark	$ 9.50	Ember	$14.00	Embody	$21.00
2	2½ "	1¼ " "	6 "	Embarrass	10.00	Embezzle	15.00	Embolden	22.00
3	3 "	1¼ " "	6 "	Embassy	12.00	Emblaze	16.00	Emboss	33.00
4	3½ "	1½ " "	8 "	Embed	18.00	Emblazon	25.00	Embossed	40.00
5	4 "	2 " "	8 "	Embellish	20.50	Emblem	32.00	Embrace	49.00

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH AIR CHAMBER, ADJUSTABLE LEVER AND BRASS PISTON-ROD.

WITH SPOUT AND TIGHT CAP.

FIG. 511.

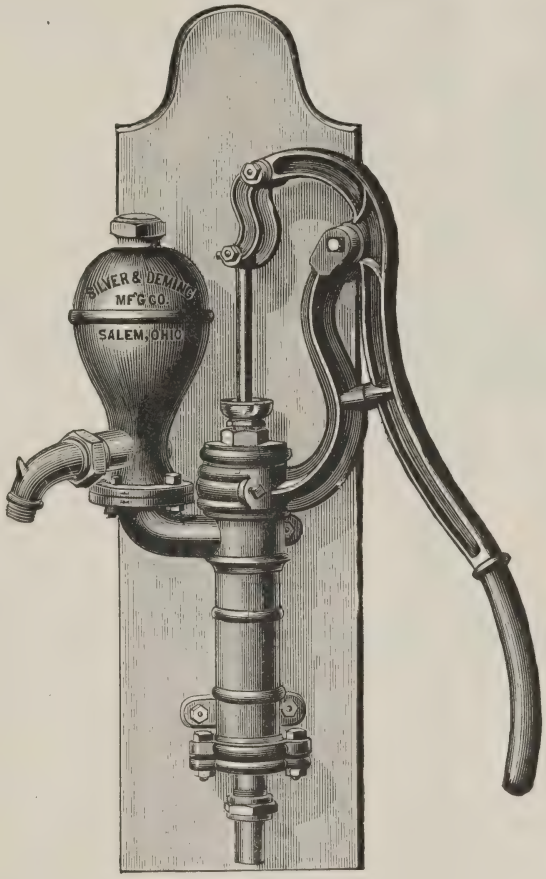


Fig. 511, represented by the above cut, is similar in its essential parts to **Fig. 510.** It is placed on a plank so that it can be fastened to the wall or to a post. In **Fig. 511,** the base (as in **Fig. 510**) is replaced by a flange, bolted to the stock or Cylinder of Pump; this retains the Brass Valve Seat and Lead or Iron Pipe coupling.

This Pump should not be placed more than twenty-five feet above the water. Freezing is prevented by raising the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	6 inch.	Emerald	$ 9.50	Eminence	$14.00	Emit	$21.00
2	2½ "	1¼ " "	6 "	Emerge	10.00	Eminent	15.00	Emitted	22.00
3	3 "	1¼ " "	6 "	Emergency	12.00	Eminently	16.00	Emollient	33.00
4	3½ "	1½ " "	8 "	Emigrant	18.00	Emissary	25.00	Emotion	40.00
5	4 "	2 " "	8 "	Emigrated	20.50	Emission	32.00	Empanel	49.00

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Anti-Freezing Hand Force Pump.

WITH SET-LENGTH PIPE AND INDEPENDENT CYLINDER.

UPWARD DISCHARGE AND COCK SPOUT.

FIG. 512.

The Pump represented by the annexed cut is constructed from the Hand Force Pump, **Fig. 508**, the plunger and valves being omitted and the piston-rod being connected to that of an independent Cylinder, attached to set-length pipe three feet below the base. The Pump is thus rendered anti-freezing by drip-hole above Cylinder, and may be placed out doors wherever an ordinary Set-length Force Pump is adaptable.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction Fitted For	Discharge Fitted For	Stroke.	Cipher.	Price.
2	2½ inch.	1¼ inch pipe.	1¼ inch pipe.	6 inch.	Emphasis	$16.00
3	3 "	1¼ " "	1¼ " "	6 "	Emphatic	18.00
4	3½ "	1½ " "	1½ " "	6 "	Emperor	24.00

Fig. 512, with 4 inch Cylinder, made to order.

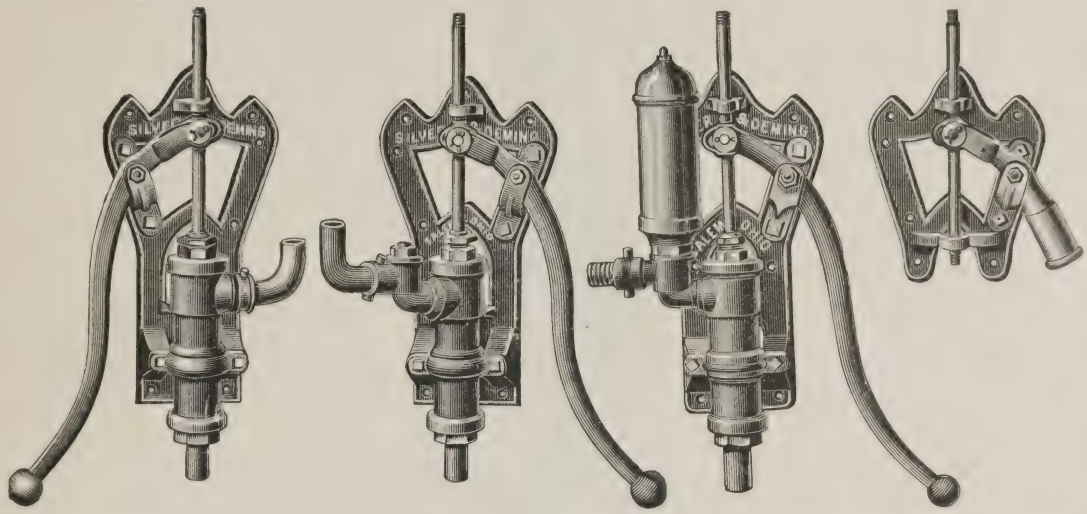
"NEW YORK"

Brass Lift and Force Pumps,

ON FRAME.

WITH RIGHT OR LEFT HANDED LEVER.

FIG. 558. **FIG. 556.** **FIG. 559.** **FIG. 557.**



The cuts on this page represent our "New York" Brass Lift and Force Pumps, **Figs. 556, 558, and 559,** and Extra Frame **Fig. 557,** to be used in operating the Pump from a story above. These Pumps are used in cities where the pressure from the water works is not sufficient to carry the water to the upper stories of large buildings. When used for this purpose the Pump should be placed within twenty or twenty-five feet of the water, and the connecting-rod continued to the story above and there attached to the working-rod of **Fig. 557,** thence the rod can be continued to the next story above, where another Extra Frame (**Fig. 557**) can be located, and so on to the top story of the highest building; and thus one Pump can be made to supply water to the different stories. These Pumps are set on a swivel attached to an ornamental *Iron Frame,* and can be placed at any desired angle; they can be used to advantage as House Force Pumps for supplying bath rooms, etc., and are often preferred for this purpose on account of their compactness and tasteful design.

The Pump with Air Chamber, **Fig. 559,** is also used in *greenhouses* and *orchards* for throwing a spray of chemically prepared water to exterminate insects on plants or fruit trees.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig.	Size Cylinder.	*Suction Fitted For	*Discharge Fitted For	Cipher.	Price.
556	2 inch.	1 inch lead pipe.	¾ inch lead pipe.	Exceed	$ 15.00
558	2 "	1 " " "	¾ " " "	Exceeded	12.00
559	2 "	1 " " "	¾ " " "	Exceeding	16.00
557	Extra Frame and Brake.			Excel	5.00

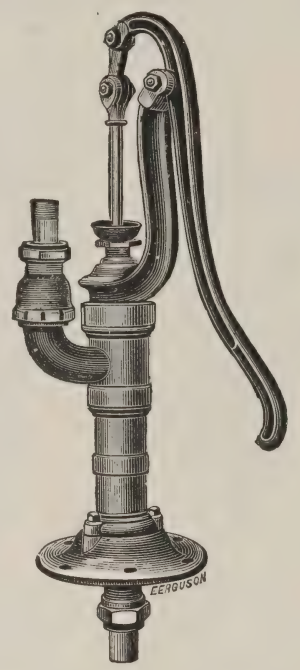
*Fitted for Lead Pipe, unless otherwise ordered. When ordered, we can fit them for either Iron Pipe or Hose. The connecting rods are threaded for ¼ inch gas pipe.

Special Hand Force Pump,

ON BASE.

WITH ADJUSTABLE LEVER, AND BRASS PISTON-ROD.

FIG. 530.



The above cut represents one of a series of Hand Force Pumps differing somewhat in construction from the preceding styles, **Figs. 502 to 511.**

We make this style of Hand Force Pump both on base and plank and with simply a discharge funnel, or with Air Chamber having double discharge, as shown in cuts of **Figs. 530, 531, 534, and 535,** on this and the following pages. These Pumps are compact and light in weight, and are therefore desirable for export trade, as size and weight are important factors in the cost of American goods in foreign markets. These Pumps have check valve in the discharge funnel, also Brass Valve Seat and are provided with Lead and Iron Pipe coupling below the base.

All parts are made to gauges, and repairs will always fit. To prevent freezing, raise the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 inch pipe.	5 inch.	Enamor	$ 8 00	Enchant	$11.50	Encompass	$17.00
1	2¼ "	1 " "	5 "	Enamored	8.75	Enchanted	12.00	Encore	17.50
2	2½ "	1¼ " "	6 "	Encamp	9.50	Enchanting	14.00	Encroach	21.00
3	2¾ "	1¼ " "	6 "	Encaustic	10.00	Encircle	14.50	Encumber	28.00
4	3 "	1¼ " "	6 "	Enchain	11.00	Encomium	15.00	Endanger	32.00

† Fitted for other sizes of American or foreign Pipe, but always for American Pipe, as listed, unless otherwise ordered.

* Brass Pumps are all Brass, Except Lever, Fulcrum and Base.

Special Hand Force Pump,

ON PLANK.

WITH ADJUSTABLE LEVER, AND BRASS PISTON-ROD.

FIG. 531.

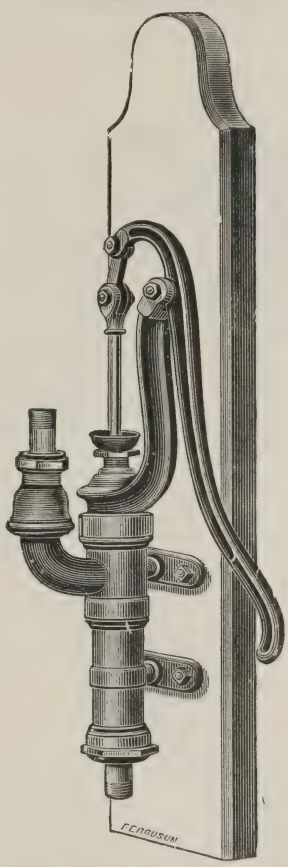


Fig. 531, represented by the above cut, differs from **Fig. 530** in the substitution of the plank and attachment screwed to the bottom of the Cylinder, in place of the base which is bolted to the stock or Cylinder in **Fig. 530**. This Pump has Brass Valve Seat and coupling for Lead or Iron Pipe.

All parts are made exact so that repairs will always fit. Freezing is prevented in the usual way of raising the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 inch pipe.	5 inch.	Endear	$ 8.00	Endow	$11.50	Enemy	$17.00
1	2¼ "	1 " "	5 "	Endeared	8.75	Endower	12.00	Energy	17.50
2	2½ "	1¼ " "	6 "	Endeavor	9.50	Endowment	14.00	Energize	21.00
3	2¾ "	1¼ " "	6 "	Ending	10.00	Endurance	14.50	Enervate	28.00
4	3 "	1¼ " "	6 "	Endless	11.00	Endwise	15.00	Enforce	32.00

† Fitted for other sizes of American or foreign Pipe, but always for American Pipe, as listed, unless otherwise ordered.

* The Brass Pumps are all Brass, except Lever, Fulcrum and Base.

Special Hand Force Pump,

ON BASE.

WITH AIR CHAMBER, ADJUSTABLE LEVER AND BRASS PISTON-ROD.

DOUBLE DISCHARGE.

FIG. 534.

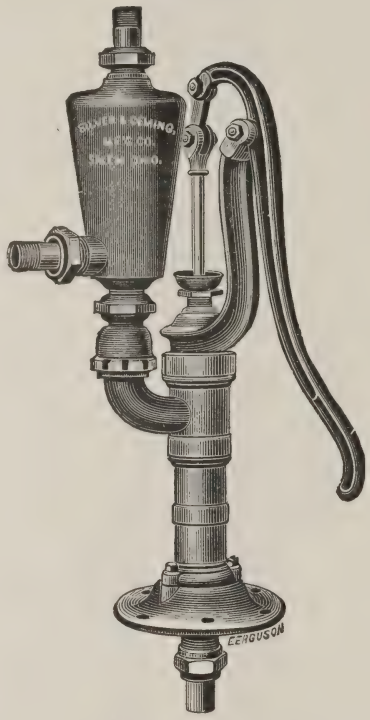


Fig. 534 is the same in construction as **Fig. 530**, with the addition of an Air Chamber with upward and side discharge. It has a base bolted to the Cylinder, and is provided with Brass Valve Seat and coupling for both Lead and Iron Suction Pipe. **Figs. 534 and 535** are both useful for forcing water into a tank from which the house supply is drawn.

Repairs will always fit, as all parts are made to exact gauges. Freezing is prevented by raising the lever to its extreme height.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 inch pipe.	5 inch.	Engage	$ 9.00	Engross	$12.50	Enhancing	$18.00
1	2¼ "	1 " "	5 "	Engaging	9.75	Engrossed	14.00	Enigma	21.00
2	2½ "	1¼ " "	6 "	Engagement	11.00	Engulf	15.00	Enigmatic	22.00
3	2¾ "	1¼ " "	6 "	Engender	12.00	Engulfing	16.00	Enjoin	29.00
4	3 "	1¼ " "	6 "	Engorge	13.00	Enhance	17.00	Enjoined	33.00

† Fitted for other sizes of American or foreign Pipe, but always for American Pipe, as listed, unless otherwise ordered.

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

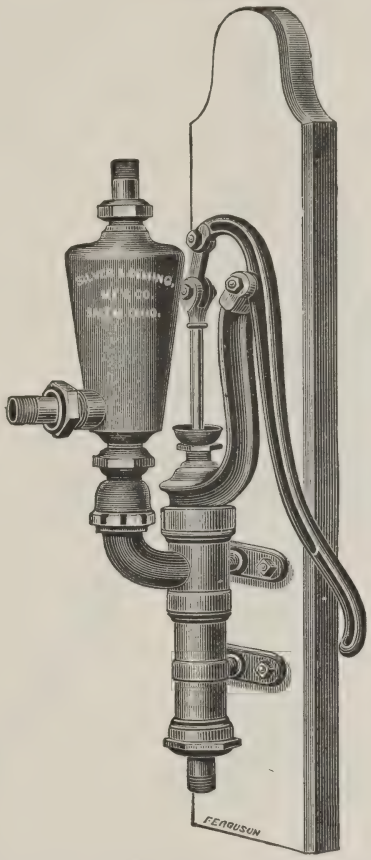
Special Hand Force Pump,

ON PLANK.

WITH AIR CHAMBER, ADJUSTABLE LEVER AND BRASS PISTON-ROD.

DOUBLE DISCHARGE.

FIG. 535.



The above cut represents **Fig. 535,** a Hand Force Pump on plank, which, in its essential working parts and adaptability, is similar to **Fig. 534,** illustrated and described on the preceding page. It differs from **Fig. 534,** however, in having a plank instead of a base; thus allowing it to be placed against the wall, where it will occupy but little space. The suction coupling is arranged for both Lead and Iron Pipe. All parts of these Pumps are made so that repairs will always fit.

To prevent freezing, raise the lever to its extreme height. These Pumps should not be placed more than twenty-five feet above the water.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
0	2 inch.	1 inch pipe.	5 inch.	Enjoy	$ 9.00	Enlisted	$12.50	Enormity	$18.00
1	2¼ "	1 " "	5 "	Enjoyable	9.75	Enliven	14.00	Enormous	21.00
2	2½ "	1¼ " "	6 "	Enjoyment	11.00	Enmity	15.00	Enough	22.00
3	2¾ "	1¼ " "	6 "	Enlighten	12.00	Ennoble	16.00	Enquirer	29.00
4	3 "	1¼ " "	6 "	Enlist	13.00	Ennui	17.00	Enrage	33.00

†Fitted for other sizes of American or Foreign Pipe, but always for American Pipe as listed, unless otherwise ordered.

*The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON BASE.

WITH WIND-MILL TOP, AIR CHAMBER AND COCK SPOUT.

FIG. 430.

The Pump represented by the above engraving, may be used in connection with a Wind Mill, or wherever power can be applied. It is also arranged for hand, which in many cases will be found convenient. The Cylinder, as in our other Hand Force Pumps, is in the stock of the Pump, which makes it a desirable Pump for out-door use in warm climates; when used in cold climates, freezing may be prevented by raising the lever to its extreme height, which trips the valves and allows the water to escape from the Cylinder. **Fig. 430** has Brass Valve Seat, brass cased piston-rod, coupling for iron suction pipe, and spout threaded for hose coupling.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1¼ inch pipe.	6 inch.	Enrapture	$13.50	Enrobing	$19.00	Enshrine	$24.50
3	3 "	1¼ " "	6 "	Enrich	15.50	Enrolled	20.50	Enshroud	36.00
4	3½ "	1½ " "	8 "	Enriched	23.00	Ensconce	31.00	Ensign	45.00
5	4 "	2 " "	8 "	Enrobe	24.00	Ensemble	37.00	Enslave	54.00

† Fitted for other sizes of Pipe, but always as listed, unless otherwise ordered.

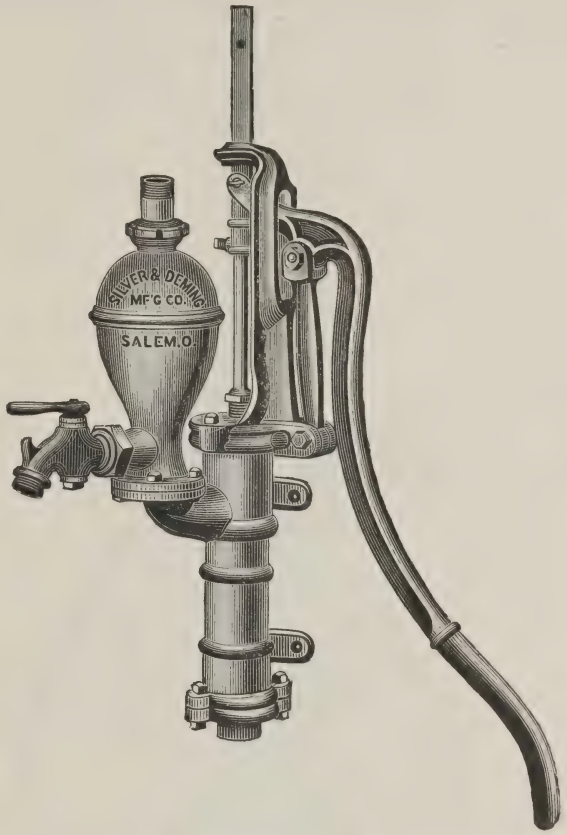
* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

Improved Hand Force Pump,

ON PLANK.

WITH WIND-MILL TOP, AIR CHAMBER AND COCK SPOUT.

FIG. 431.



The above cut represents Fig. 431, a Pump identical with **Fig. 430**, on the opposite page, both in adaptation and construction, except that it is made with *Brackets* instead of *Base*, and is fastened to a plank which is always furnished with the Pump, unless ordered without. The Plank is not shown in the cut.

The Cylinder being in the stock of Pump makes it necessary to trip the valves by raising the lever to its full height, in order to prevent freezing. All the essential parts of **Fig. 431** are the same as **Fig. 430.**

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1¼ inch pipe.	6 inch.	Enslaving	$13.50	Entailed	$19.00	Entertainer	$24.50
3	3 "	1¼ " "	6 "	Ensnare	15.50	Entailing	20.50	Enthsuiast	36.00
4	3½ "	1½ " "	8 "	Ensue	23.00	Entangle	31.00	Entice	45.00
5	4 "	2 " "	8 "	Entail	24.00	Entertain	37.00	Enticing	54.00

† Fitted for other sizes of Pipe, but always as listed, unless otherwise ordered.

* The Brass Pumps are all Brass, except Air Chamber, Lever, Fulcrum and Base.

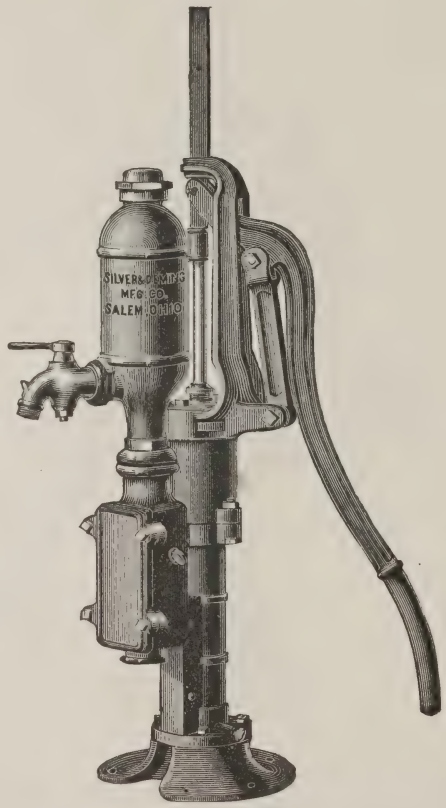
THE "TORRENT"

Double-Acting Force Pump,

ON BASE.

WITH WIND-MILL TOP, AIR CHAMBER AND COCK SPOUT.

FIG. 480.



The above cut represents our new Double-acting Force Pump on Base, the "Torrent," arranged to operate by hand or attach to Wind Mill or other power. The peculiar construction and arrangement of the valves and water ways make it the easiest working Double-acting Pump on the market, and its lifting capacity is the greatest of any Pump we manufacture.

The Valves and Seats are made of Brass. The Valves can be removed and replaced by simply detaching the Face Plate of the Valve Case. This Pump is especially adapted for Wind Mill, Factory, or Railroad use.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		* BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1¼ inch pipe.	6 inch.	Entire	$25.00	Entitle	$40.00	Entity	$50.00
4	3 "	1½ " "	6 "	Entirely	30.00	Entitled	45.00	Entomb	60.00

* In the Brass Pumps, all parts, coming in contact with the liquid, are made entirely of Brass.

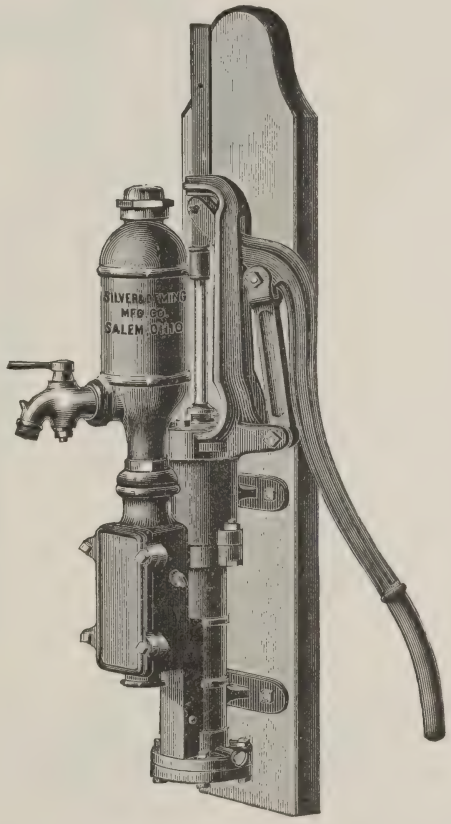
THE "TORRENT"

Double-Acting Force Pump,

ON PLANK.

WITH WIND-MILL TOP, AIR CHAMBER AND COCK SPOUT.

FIG. 481.



The cut on this page represents the "Torrent" Double-acting Force Pump with brackets, attached to a plank. In mechanical construction the working parts are identical with **Fig. 480** on the preceding page. As in all our Pumps, parts are made to exact gauges so that repairs will always fit.

Both **Figs. 480** and **481** have drip-cocks for draining the Pump to prevent freezing.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

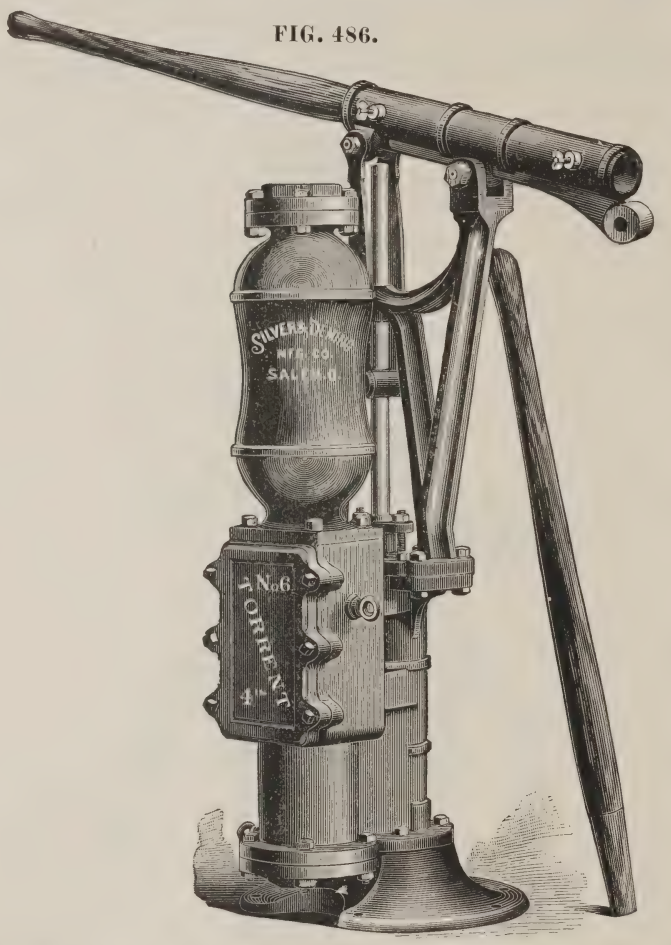
No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1¼ inch pipe.	6 inch.	Entomic	$25.00	Entrails	$40.00	Entrap	$50.00
4	3 "	1½ " "	6 "	Entomical	30.00	Entrance	45.00	Entrapped	60.00

* In the Brass Pumps, all parts, coming in contact with the liquid, are made entirely of Brass.

THE "TORRENT"
Double-Acting Force Pump.

FOR FACTORY, WAREHOUSE AND RAILROAD USE.

FIG. 486.



In its working parts this Pump is similar to the "Torrent" Pumps, **Figs. 480** and **481**, illustrated and described on the two preceding pages. **Fig. 486** however, is larger and is arranged with brakes or levers for operating by hand with two or four men if necessary. When so ordered it is arranged with Forked Rod (for Wind Mill or other Power) for attaching to the end of brake or lever socket. The Valves of this Pump are made of brass, and are so arranged that they can be easily taken out and replaced by simply removing the Face Plate of Valve Box. The Piston-rod is made of bronze metal, and drip-cocks are provided to drain the Pump and prevent freezing.

This Pump is a model of convenience and mechanical workmanship, and has no superior for fire protection, and other purposes for which it is adapted.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	Capacity per Revolution.	IRON.		BRASS-LINED CYLINDER.	
					Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1½ inch pipe.	8 inch.	⅓ gallon.	Entreat	$45.00	Entwisted	$50.00
4	3 "	2 " "	8 "	½ "	Entwine	55.00	Enunciate	61.00
6	4 "	2½ " "	8 "	⅞ "	Entwist	65 00	Envelope	72.00

Forked Rod Coupling for Wind Mill Connection, $2.50 extra list.

THE "TORRENT"

Double-Acting Force Pump.

WITH PITMAN FOR POWER.

FOR FACTORY, WAREHOUSE AND RAILROAD USE.

FIG. 487.

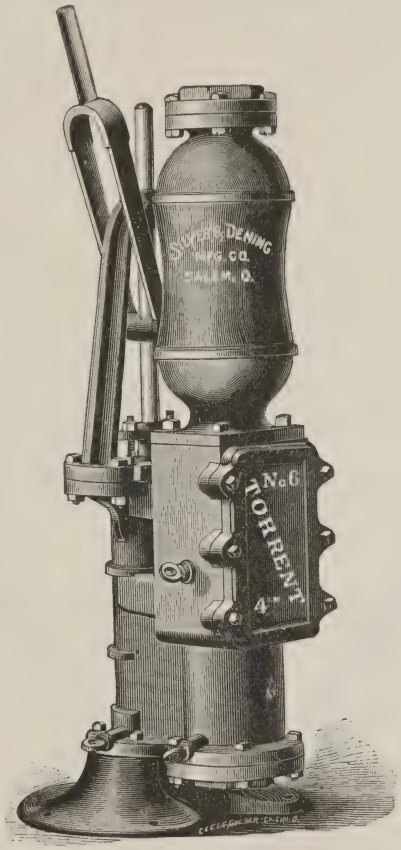


Fig. 487, is the same in construction precisely as **Fig. 486,** shown on the opposite page, except that it is arranged for power by the substitution of a Pitman for the Hand Brakes.

All the essential working parts are the same as in **Fig. 486,** and an additional description is unnecessary.

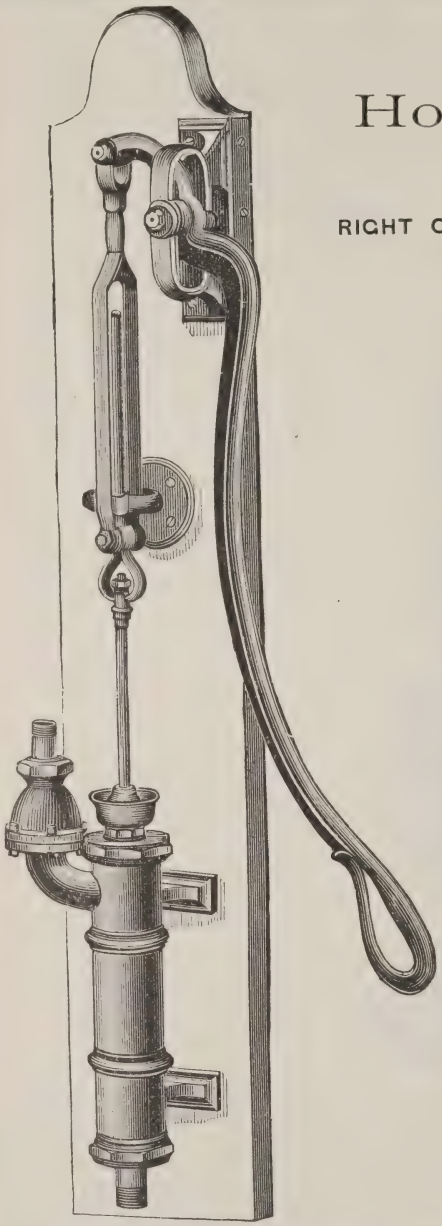
The **Speed** this Pump should run is about forty to sixty revolutions per minute; this of course would vary according to the height the water is forced. This Pump is an excellent one for use in factories, or wherever power can be obtained, and a steady supply of water is needed.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	Capacity per Revolution.	IRON.		BRASS-LINED CYLINDER.	
					Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1½ inch pipe.	8 inch.	⅓ gallon.	Enviable	$45.00	Envoy	$50.00
4	3 "	2 " "	8 "	½ "	Envious	55.00	Eolian	61.00
6	4 "	2½ " "	8 "	⅞ "	Environed	65.00	Epaulet	72.00

Forked Rod Coupling for Wind Mill Connection, $2.50 extra list.



IMPROVED
House Force Pump,
ON PLANK.

RIGHT OR LEFT HANDED. WITHOUT AIR CHAMBER.

FIG. 520.

The cut on this page represents a Force Pump which we recommend particularly for house use, in plumbing jobs, etc. **Fig. 520** has a brass piston-rod with pitman and guide. The lever is furnished for either right or left hand, but is always arranged right handed, unless otherwise ordered. These Pumps are made with brass suction coupling for Lead or Iron Pipe; they are mounted on a handsome plank, and present a fine appearance. **Fig. 520** can be used where the water is not over twenty-five feet below the Pump Cylinder.

In forcing water a long distance, or to a considerable height, **Figs. 521, 522** and **524** are preferable, as the Air Chamber assists the working of the Pump.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

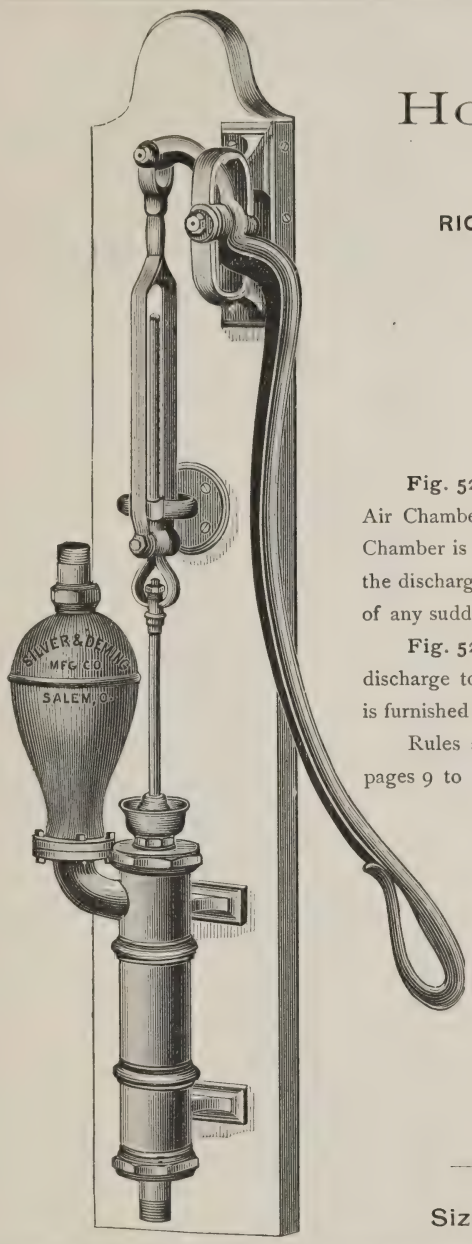
Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	7 inch.	Ephemeral	$14.00	Epigraph	$18.00	Episcopacy	$26.00
2	2½ "	1¼ " "	7 "	Epidemic	15.00	Epilepsy	20.00	Episcopal	30.00
4	3 "	1¼ " "	7 "	Epidemy	16.50	Epileptic	22.00	Episode	35.00
5	3¼ "	1½ " "	7 "	Epigene	20.00	Epilogue	25.00	Epistle	40.00
6	3½ "	1½ " "	7 "	Epigram	22.00	Epiphany	32 00	Epistolize	47.00

† Fitted for other sizes Pipe, but always as listed, unless otherwise ordered.

* The Brass Pumps are all Brass, except Lever, Fulcrum, Rod Guide and Discharge Funnel.

Furnished with Metallic Valves for pumping hot water when so ordered, at an additional cost. Furnished without plank at $1.00 less list.



IMPROVED
House Force Pump,
ON PLANK.

RIGHT OR LEFT HANDED. WITH AIR CHAMBER.

UPWARD DISCHARGE.

FIG. 521.

Fig. 521 is the same in construction as **Fig. 520**, with the addition of an Air Chamber with upward discharge. In forcing to a great height, the Air Chamber is an advantage, as it assists the working of the Pump, and causes the discharge of a steady and continuous stream of water, relieving the Pump of any sudden strain or concussion.

Fig. 521 is a popular style of Pump for house plumbing jobs, where a discharge to the tank only is necessary. This Pump, the same as **Fig. 520**, is furnished with Brass Valve Seat, and fitted for both Lead and Iron Pipe.

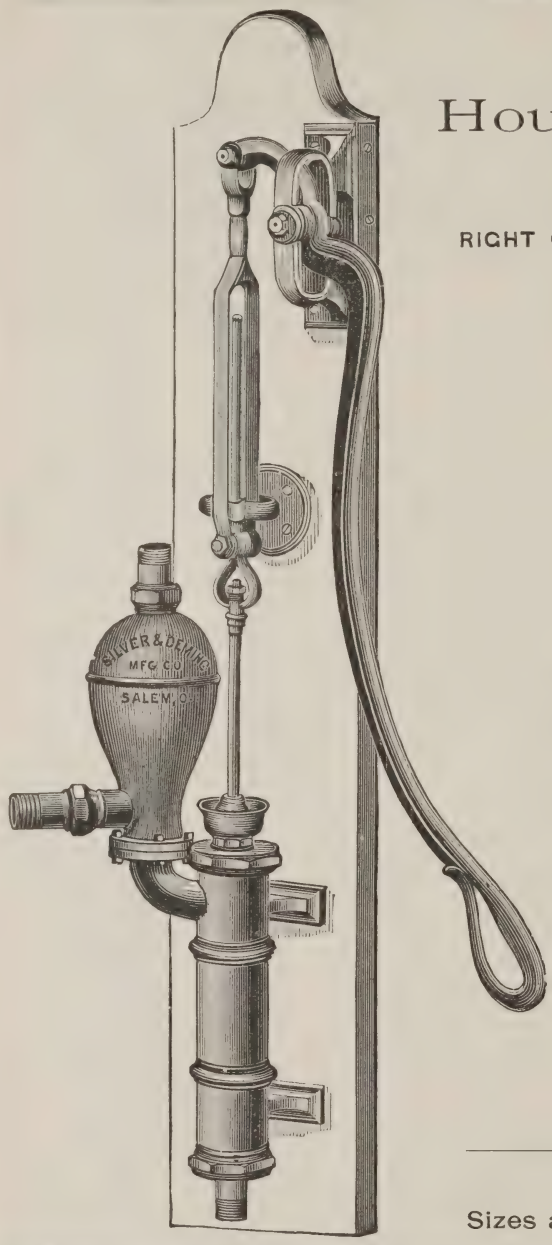
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	7 inch.	Epithet	$16.00	Equable	$21.00	Equation	$28.00
2	2½ "	1¼ " "	7 "	Epitome	17.00	Equal	23.00	Equator	32.00
4	3 "	1¼ " "	7 "	Epitomist	18.50	Equality	25.00	Equatorial	37.00
5	3¼ "	1½ " "	7 "	Epitomize	23.00	Equalize	28.00	Equestrian	43.00
6	3½ "	1½ " "	7 "	Epizootic	25.00	Equate	35.00	Equiform	50.00

† Fitted for other sizes Pipe, but always as listed, unless otherwise ordered.

* The Brass Pumps are all Brass, except Lever, Fulcrum, Rod Guide and Air Chamber. Brass Air Chamber furnished for additional cost of material only. Furnished with Metallic Valves for pumping hot water, when so ordered, at an additional cost. Furnished without plank at $1.00 less list.



IMPROVED
House Force Pump,
ON PLANK.

RIGHT OR LEFT HANDED. WITH AIR CHAMBER.

DOUBLE DISCHARGE.

FIG. 522.

Fig. 522 is the same in construction as **Fig. 521**, with the addition of a side discharge on the Air Chamber. This Pump is adapted to the same purposes as those on the two preceding pages, and what is said of **Fig. 521** as a House Force Pump is also true of this Pump. Where both an upward and a side discharge are required, this Force Pump will be found a very desirable one. It has Brass Valve Seat and brass coupling below the base for both Iron and Lead Pipe, the same as **Figs. 520 and 521.**

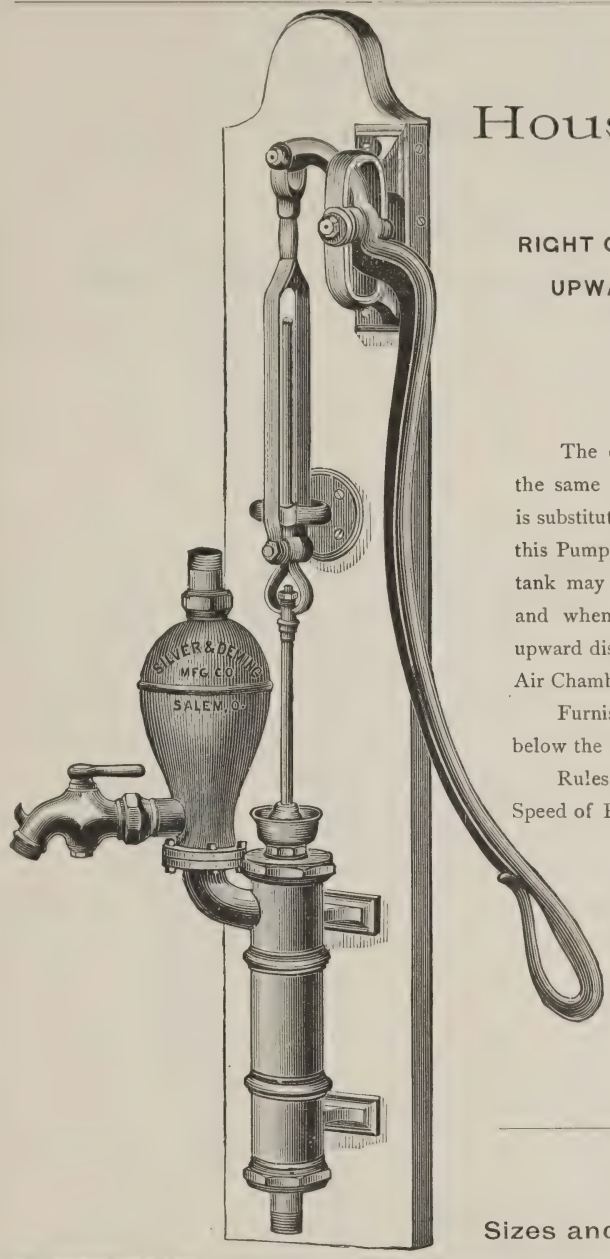
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	7 inch.	Equinox	$16.75	Equipoise	$21.75	Equivocal	$28.75
2	2½ "	1¼ " "	7 "	Equip	17.75	Equitable	23 75	Eradicate	32.75
4	3 "	1¼ " "	7 "	Equipped	19.50	Equitably	26.00	Erase	38.00
5	3¼ "	1½ " "	7 "	Equipage	24.00	Equity	29.00	Erased	44.00
6	3½ "	1½ " "	7 "	Equipment	26.00	Equivocate	36.00	Erasion	51.00

† Fitted for other size Suction and Discharge Pipe, but always as listed, unless otherwise specified.

* The Brass Pumps are all Brass except Lever, Fulcrum, Rod Guide and Air Chamber. Brass Air Chamber furnished for additional cost of material only. Furnished with Metallic Valves for pumping hot water, when so ordered, at an additional cost. **Fig. 522,** without plank, $1.00 less list.



IMPROVED
House Force Pump,
ON PLANK.

RIGHT OR LEFT HANDED. WITH AIR CHAMBER.
UPWARD DISCHARGE AND COCK SPOUT.

FIG. 524.

The cut on this page represents a Pump in all respects the same as **Fig. 522**, with the exception that a *Cock Spout* is substituted for the side discharge tube. An advantage in this Pump over **Figs. 521** and **522**, is that the water in the tank may be drawn direct therefrom by means of the Cock, and when using the Cock Spout for pumping direct, the upward discharge may be cut off by a service cock above the Air Chamber.

Furnished with Brass Valve Seat and brass coupling below the base for both Lead and Iron Pipe.

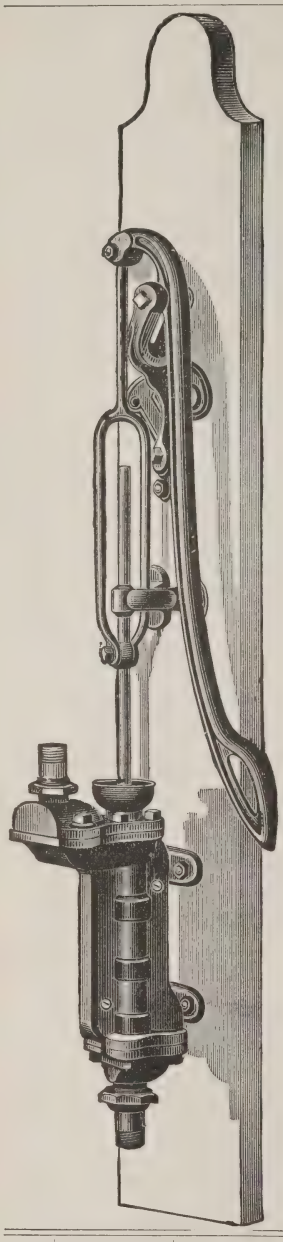
Rules and Tables for Capacity, Required Power, and Speed of Pump, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*BRASS.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	7 inch.	Erect	$18.50	Ermine	$23.50	Erudite	$33.00
2	2½ "	1¼ " "	7 "	Erected	19.50	Erotic	25.50	Erudition	37.00
4	3 "	1¼ " "	7 "	Erection	21.00	Errand	27.50	Eruption	42.00
5	3¼ "	1½ " "	7 "	Erector	25.50	Errantry	30.50	Eruptive	48.00
6	3½ "	1½ " "	7 "	Ergot	27.50	Erratic	37.50	Escalop	55.00

† Fitted for other size Suction and Discharge Pipe, but always as listed, unless otherwise specified.

* The Brass Pumps are all Brass, except Lever, Fulcrum, Rod Guide, Air Chamber and Cock. Furnished with Metallic Valves for pumping hot water, when so ordered, at an additional cost. Brass Air Chamber and Brass Cock furnished, when ordered, at an additional cost. **Fig. 524**, without plank, $1.00 less list.



DOUBLE-ACTING

House Force Pump,

ON PLANK.

RIGHT OR LEFT HANDED. WITHOUT AIR CHAMBER.

FIG. 541.

The annexed cut represents **Fig. 541**, a Double-acting Suction and Force Pump without Air Chamber. It is mounted on a plank and has a Reversible Lever and Fulcrum, so that it can be changed from Right to Left Hand or vice versa. This Pump is Double-acting and discharges at both strokes of the piston. It therefore has double the capacity of a Single-acting Pump of the same diameter Cylinder and length of stroke. It is an excellent Pump for use where a continuous stream of water is required. **Fig. 542,** shown on the next page, is, on account of having an Air Chamber, better adapted for forcing the water to a great distance.

In ordering Pump with Metallic Valves by telegraph, the Cipher word for the complete Pump should be written (for Iron or Brass Cylinder) then the Cipher word for Metallic Valves.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*METALLIC VALVES FOR IRON OR BRASS CYLINDER.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Net extra
1	2¼ inch.	1¼ inch pipe.	7 inch.	Escapade	$14.00	Esquire	$24.00	Estrange	$1.75
2	2½ "	1¼ " "	7 "	Eschew	17.00	Essayist	29.00	Etcher	2.25
3	3 "	1½ " "	7 "	Escort	21.00	Essence	40.00	Etching	3.00
4	3½ "	2 " "	7 "	Escritoire	25.00	Establish	69 50	Eternal	4.25
5	4 "	2 " "	7 "	Espionage	37.00	Esteem	94.00	Eternity	6.00
6	4½ "	2½ " "	7 "	Espousal	50.00	Esteemed	136.00	Ethereal	8.00

† Fitted for other sizes Suction and Discharge Pipe, but always as listed, unless otherwise ordered.

* The Metallic Valves are necessary where the Pump is used for hot water. The prices given for Metallic Valves are net extra over net price of either the Iron or Brass Cylinder Pumps. **Fig. 541,** without plank, $1.00 less list.

DOUBLE-ACTING
House Force Pump,
ON PLANK.

RIGHT OR LEFT HANDED. WITH AIR CHAMBER.

DOUBLE DISCHARGE.

FIG. 542.

The cut on this page is an accurate representation of **Fig. 542**, a Double-acting Force Pump, which is the same as **Fig. 541**, on the preceding page, with double discharge Air Chamber added. The Air Chamber is an assistance in working the Pump, where the water is forced through hose or to a great distance. Brass Cylinder Pumps will be furnished with Brass Air Chambers when especially ordered, at a price to cover the additional cost of the material only.

The Metallic Valves are necessary where the Pump is to be used for hot water.

In ordering Pump with Metallic Valves by telegraph, the Cipher word for the complete Pump should be written (for Iron or Brass Cylinder), then the Cipher word for Metallic Valves.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*METALLIC VALVES FOR IRON OR BRASS CYLINDER.	
				Cipher.	Price	Cipher.	Price.	Cipher.	Net extra.
1	2¼ inch.	1¼ inch pipe.	7 inch.	Etherize	$16.00	Etymology	$ 26.00	Euphonic	$1.75
2	2½ "	1¼ " "	7 "	Ethical	19.00	Eucharist	31.00	European	2.25
3	3 "	1½ " "	7 "	Ethics	23.50	Euchre	42.00	Euterpe	3.00
4	3½ "	2 " "	7 "	Ethnology	28.50	Eulogize	73 00	Euterpean	4.25
5	4 "	2 " "	7 "	Etiquette	42.00	Eulogy	98.00	Evacuate	6.00
6	4½ "	2½ " "	7 "	Etruscan	55 00	Euphony	141.00	Evade	8.00

† Fitted for other sizes of Suction and Discharge Pipe, but always as listed, unless otherwise ordered.
* Prices given for Metallic Valves are net extra, over net price of either Iron or Brass Cylinder Pumps.
Fig. 542, without side discharge on Air Chamber, at same price. Without plank, $1.00 less list.

House Force Pump,

ON PLANK.

WITH AIR CHAMBER, FLY-WHEEL AND CRANK.

DOUBLE DISCHARGE.

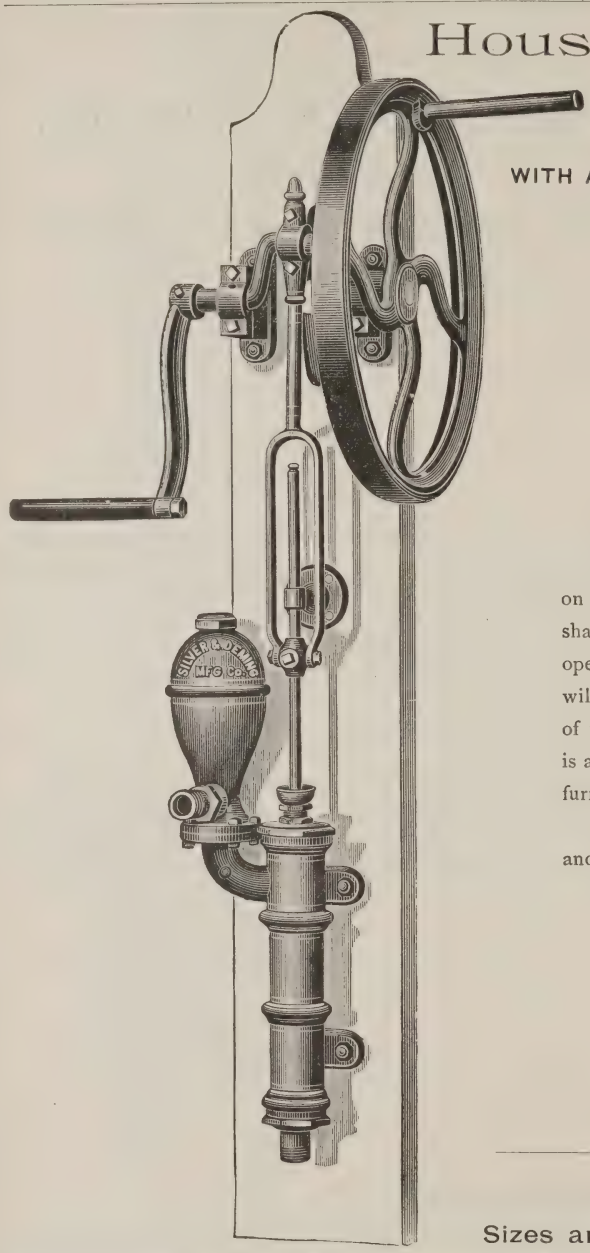


FIG. 526.

The annexed cut represents a House Force Pump on plank, similar to **Fig. 521**, with Pitman and Crank-shaft with Fly-wheel and two Handles, so that it can be operated by two or four men, as desired. This Pump will be found very convenient for raising large quantities of water to a tank located at a considerable height. It is also a very efficient Fire Pump. All Brass Air Chamber furnished when ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	Capacity per Revolution.	IRON.		* BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	2 inch.	1 inch pipe.	6 inch.	.082 gallon.	Evading	$36.00	Evaporate	$45.00
2	2½ "	1¼ " "	6 "	.128 "	Evangelic	38.00	Evasion	48.00
4	3 "	1¼ " "	6 "	.184 "	Evangelical	40.00	Evasive	56.00
5	3¼ "	1½ " "	6 "	.210 "	Evangelist	42.00	Evening	70.00
6	3½ "	1½ " "	6 "	.250 "	Evangelize	45.00	Evenly	85.00

† Fitted for other size Suction and Discharge Pipe, but always as listed, unless otherwise specified.

* The Brass Pumps are all Brass except Air Chamber, Rod Guide, Pitman, Fly-wheel, Cranks, etc., furnished with Metallic Valves for pumping hot water, at an additional net cost as given in list on next page. Iron Cock with Brass Plug, $2.50 extra list. All Brass Cock, $5.00 extra list. With Tight and Loose Pulleys, $5.00 extra list.

Double-Acting Force Pump,

ON PLANK.

WITH TIGHT AND LOOSE PULLEYS FOR POWER.

DOUBLE DISCHARGE.

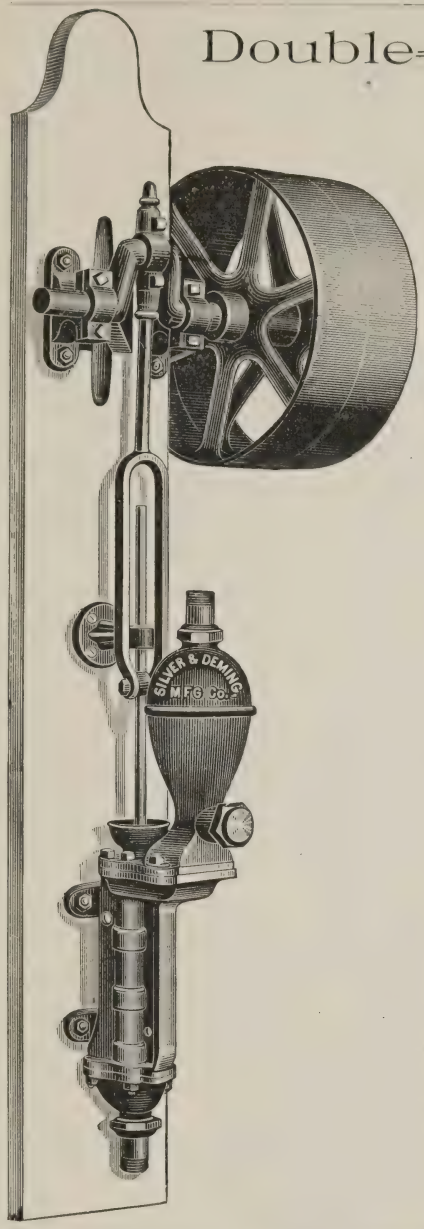


FIG. 543.

The annexed cut represents a Double-acting Suction and Force Pump on plank, with Tight and Loose Pulleys for Power. **Fig. 543** is the same as **Fig. 542**, with Pulleys and Crank-shaft in place of the Lever or Handle. This Pump will be found a very useful one where power can be applied.

In ordering **Fig. 543**, state the quantity of water to be raised per minute or hour; the size and speed of the driving pulley, and we will then fit the Pump with pulleys of the proper size.

Brass Cylinder Pumps will be furnished with Brass Air Chamber when especially ordered, at price of the additional cost of material only.

The Metallic Valves are necessary where the Pump is used for hot water.

In ordering Pump with Metallic Valves by telegraph, the Cipher word for complete Pump should be written (for Iron or Brass Cylinder), then the Cipher word for Metallic Valves.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	†Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDER.		*METALLIC VALVES FOR IRON OR BRASS CYLINDER.	
				Cipher.	Price.	Cipher.	Price.	Cipher.	Net extra.
1	2¼ inch.	1¼ inch pipe.	7 inch.	Event	$39.00	Evidence	$ 58.00	Evoke	$1.75
2	2½ "	1¼ " "	7 "	Eventful	41.00	Evident	61.00	Evoking	2.25
3	3 "	1½ " "	7 "	Eventual	45.00	Evidently	75.00	Evolute	3.00
4	3½ "	2 " "	7 "	Everglade	51.00	Evil	94.00	Evolution	4.25
5	4 "	2 " "	7 "	Evergreen	63 00	Evilly	119.00	Evolve	6.00
6	4½ "	2½ " "	7 "	Evermore	80.00	Evitable	160.00	Evolving	8.00

† Fitted for other sizes of Suction and Discharge Pipe, but always as listed, unless otherwise ordered.

* Prices for Metallic Valves are net extra over net price of Pumps. Iron Cock with Brass Plug, $2.50 extra list. All Brass Cock, $5.00 extra list. With Fly-wheel and Handles, like **Fig. 526**, same price.

Two-Cylinder Force Pump,

ON PLANK.

WITH AIR AND VACUUM CHAMBERS, PISTON-ROD GUIDE AND WROUGHT-IRON LEVERS.

DOUBLE DISCHARGE.

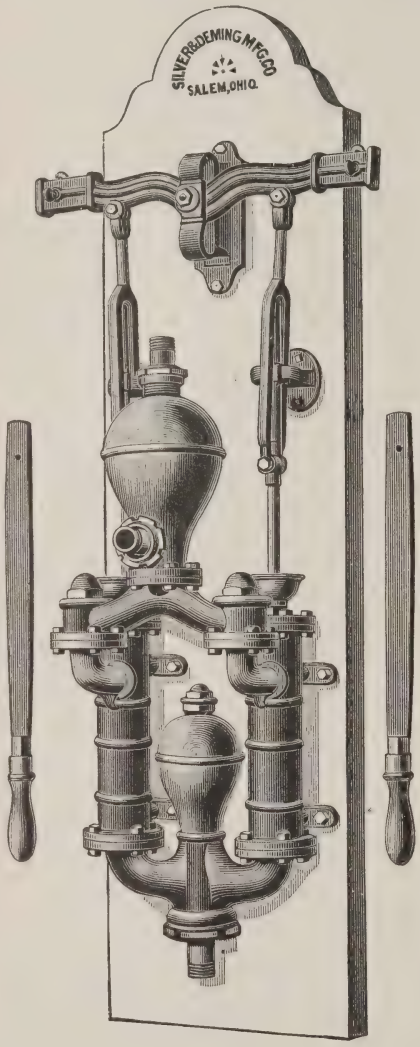


FIG. 545.

The Pump shown on this page is constructed from two Single-acting Pumps, joined at top and bottom by flange joints, with one suction and two discharge openings. The two discharges enter into an Air Chamber, to which is attached the regular discharge pipe. The suction opening enters a Vacuum Chamber between the Cylinders, to which the suction water-ways branch on either side to enter the Cylinders. A check valve is placed between the suction pipe and the Vacuum Chambers to prevent the escape of the water while pumping, and to keep the valves of each Cylinder submerged. This prevents the necessity of priming the Pump as often as would otherwise be required; however a cap is attached to the top of Vacuum Chamber for convenience in priming when it becomes necessary. Plugs or drip-cocks are provided for draining the Pump of water to prevent freezing.

The effect of this Two-Cylinder Pump is the same as though it were Double-acting; and for use in Factories, Warehouses, Railroad Stations, etc., to force water into a tank, there is nothing more efficient.

Two Wrought-iron Levers, with Wood Handle at one end, are furnished so that two or more men can work the Pump at once.

The plank the Pump is attached to, is made in pieces mortised together, so that warping is impossible.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDERS.	
				Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	7 inch.	Exact	$35.00	Exactly	$50.00
2	2½ "	1½ " "	7 "	Exacted	40.00	Exactness	60.00
4	3 "	2 " "	7 "	Exacting	50.00	Exactor	85.00

Two-Cylinder Force Pump,

ON PLANK.

WITH AIR AND VACUUM CHAMBERS, PISTON-ROD GUIDE, FLY-WHEEL AND HANDLES. DOUBLE DISCHARGE.

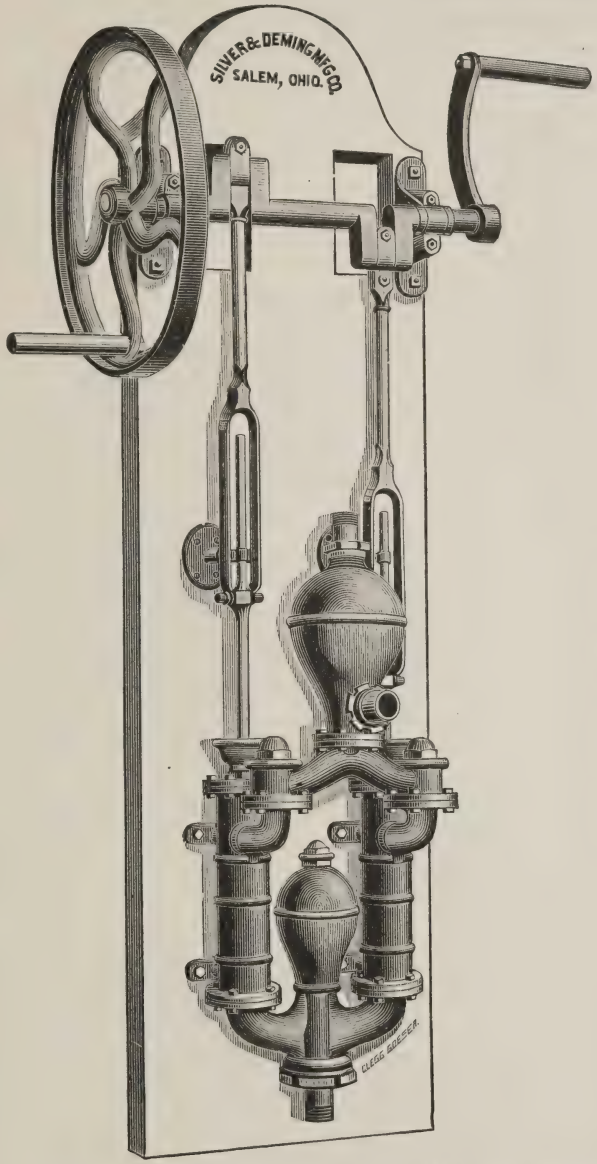


FIG. 546.

The cut on this page represents a Two-Cylinder Force Pump, the working parts of which are identical with **Fig. 545**, shown on the preceding page. For the levers, however, are substituted a Crank-shaft with Pitmans, Fly-wheel and two Handles, so that two or four men can operate the Pump.

Fig. 546 can be used for any purpose to which **Fig. 545** is adapted. The plank is made like that of **Fig. 545**, so it will not warp. The diameter of Fly-wheel is twenty-four inches.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder	Suction and Discharge Fitted for	Stroke.	IRON.		BRASS CYLINDERS.	
				Cipher.	Price.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	7 inch.	Examine	$55.00	Exasperate	$70.00
2	2½ "	1½ " "	7 "	Examining	60.00	Excavate	80.00
4	3 "	2 " "	7 "	Example	75.00	Excavation	100.00

THE "PARAGON"
Two-Cylinder Brass Force Pump.

FOR HOUSE, SHIP, AND FACTORY USE.

UPWARD DISCHARGE.

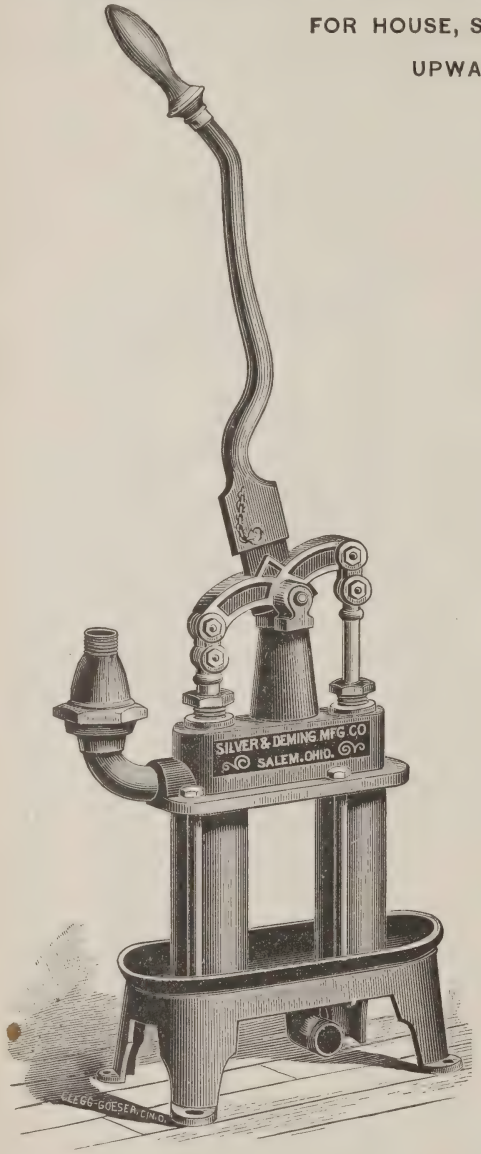


FIG. 612.

The accompanying illustration represents a Two-Cylinder Pump, which is practically the same as a Double-acting Pump. The Cylinders, Air Chamber, Piston-Rods, and all other working parts of the Pump are made of Brass. As may be seen by examination of the cut, the lever is worked horizontally, the Cylinders being vertical and working alternately.

This Pump, for house use, can be placed under the sink, out of the way; and in many sections of the country it is a favorite Pump for domestic purposes.

To prevent freezing, drip-cocks are provided, so that water can be drained off in cold weather, when the Pump is not in use.

We make three sizes of the "Paragon" Pump, as listed below.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	*Suction Fitted For	*Discharge Fitted For	Capacity per revolution.	Cipher.	Price.
1	2 inch.	1¼ inch pipe.	1 inch pipe.	.2 gallon.	Excelled	$25.00
2	2½ "	1¼ " "	1¼ " "	.3 "	Excelling	35.00
3	3 "	1½ " "	1¼ " "	.5 "	Exception	60.00

* Fitted for either Lead or Iron Pipe, as ordered. Fitted for other sizes Suction and Discharge Pipe, but always as listed, unless otherwise specified.

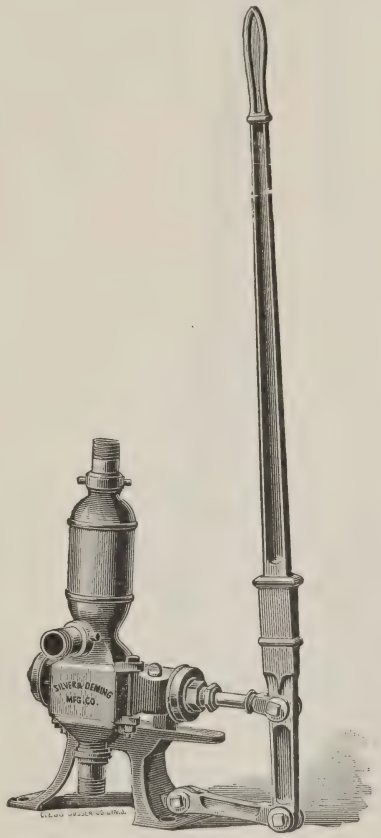
THE "ACME"

Double-Acting Brass Force Pump.

WITH AIR CHAMBER AND ADJUSTABLE LEVER.

DOUBLE DISCHARGE.

FIG. 607.



The cut on this page represents **Fig. 607**, our "Acme" Double-acting Brass Force Pump. It is what its name indicates, the height of perfection, both in construction and design. **Fig. 607** is particularly useful as a House Force Pump, Deck Pump, Fire Pump, and for other purposes to which a Pump of this class is adapted. It has an upward and side discharge on the Air Chamber, and is all Brass except the Base, Lever and Link.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	*Suction Fitted For	*Discharge Fitted For	Stroke	Cipher.	Price.
1	2½ inch.	1¼ inch pipe.	1 inch pipe.	4 inch.	Fabricate	$30.00
2	3 "	1½ " "	1¼ " "	4 "	Fabulous	35.00

*Fitted for other sizes Suction and Discharge Iron Pipe, Lead Pipe or Hose, but always for Iron Pipe and Hose, as listed, unless otherwise ordered.

THE "CLIMAX"
Double-Acting Force Pump.

WITH AIR CHAMBER AND ADJUSTABLE LEVER.

SIDE DISCHARGE.

FIG. 608.

The above cut represents our "Climax" Double-acting Horizontal Force Pump. It is constructed of Iron, with Leather Valves; and is neat, compact and substantial. It can be used as a House Force Pump, Deck Pump, Fire Pump, and for a variety of other purposes. The "Climax" Pumps are furnished with suction and discharge fitted for Iron Pipe and Hose. When so ordered, we fit them for Lead Pipe.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

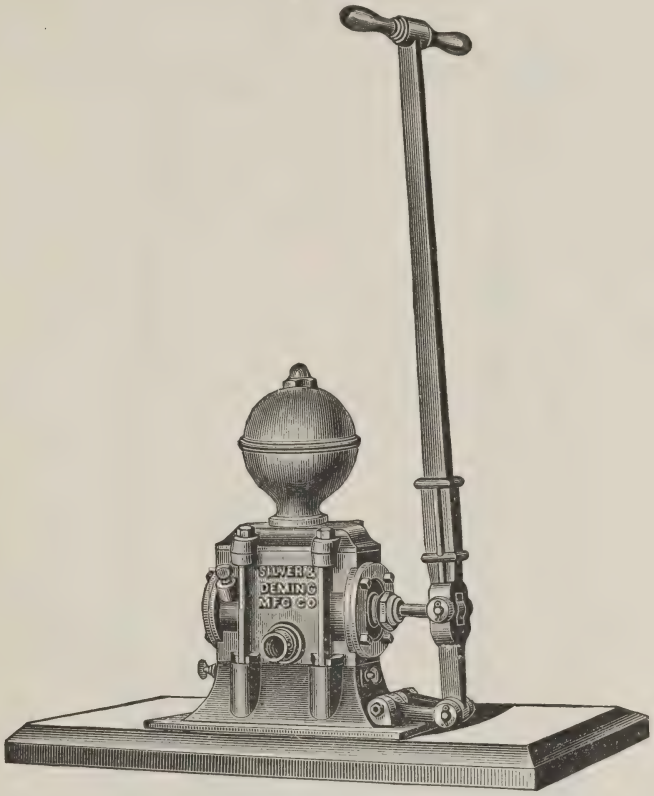
No.	Size Cylinder.	*Suction Fitted For	*Discharge Fitted For	Stroke.	Cipher.	Price.
1	2½ inch.	1¼ inch pipe.	1 inch pipe.	4 inch.	Fable	$16.00
2	3 "	1½ " "	1¼ " "	4 "	Fabric	18.00

*Fitted for other sizes Suction and Discharge Iron Pipe, Lead Pipe or Hose, but always as listed for Iron Pipe and Hose, unless otherwise ordered.

THE "TRIUMPH"
Double-Acting Force Pump.

WITH AIR-CHAMBER, BRASS-LINED CYLINDER AND ADJUSTABLE LEVER.

FIG. 601.



This Pump is extensively used in Factories, Warehouses, Vessels, etc., for general purposes and for fire protection. As a Boiler Test Pump, **Fig. 601** will also do excellent service. It is mounted on a plank, and is always fitted for both Iron Pipe and Hose, unless especially ordered for Lead Pipe. All sizes of this Pump are fitted with Metallic Valves, but when especially so ordered, Nos. 1 and 2 Pumps are fitted with Leather Valves. Brass plugs or drip-cocks are provided at each end of the bed plate, for letting the water out of the Cylinder, to prevent freezing; also, a similar plug is attached to side of Cylinder, for priming the Pump when necessary. A malleable wrench, fitting all nuts and couplings, is furnished with each Pump. The Upper Valves may be reached by unscrewing the brass nuts and lifting off the Air Chamber. The Lower Valves may then be reached by lifting off the Cylinder, or body of the Pump.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	* Suction Fitted For	* Discharge Fitted For	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1¼ inch pipe.	1 inch pipe.	4½ inch.	Facade	$27.00	Facing	$75.00
2	3 "	1¼ " "	1 " "	4½ "	Facetious	27.00	Faction	75.00
3	4 "	1½ " "	1¼ " "	4½ "	Facial	28.00	Faculty	90.00
4	5 "	2 " "	1½ " "	5 "	Facility	42.00	Fading	110.00

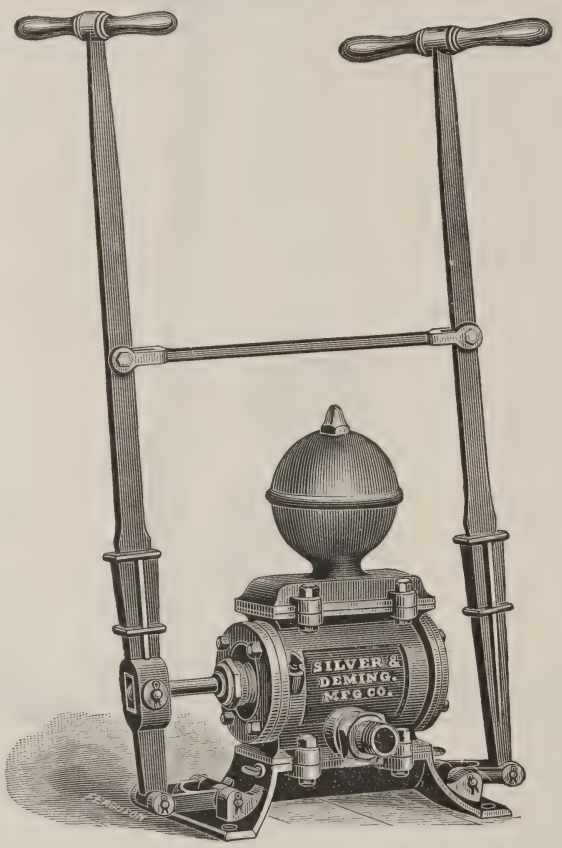
* Fitted for both Iron Pipe and Hose, as listed, but will be fitted for Lead Pipe, when so ordered.

THE "TRIUMPH"

Double-Acting Force Pump.

WITH AIR CHAMBER, BRASS-LINED CYLINDER, AND DOUBLE LEVERS.

FIG. 602.



The cut on this page represents our "Triumph" Double-acting Force Pump, similar to **Fig. 601**, with two Levers. This Pump will be found a very useful one in Factories, Vessels, Warehouses and other places where large quantities of water are to be elevated. The Cylinder is Brass-lined; and the Valves, Valve Seats Piston-rod, Plunger and other parts coming in contact with the water, are made of Bronze. The levers can be disconnected, so that it can be worked by one lever if preferred. Provided with drip-cocks for priming and to prevent freezing Furnished with malleable wrench for taking the Pump apart.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	* Suction Fitted for	* Discharge Fitted for	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
4	5 inch.	2 inch pipe.	1½ inch pipe.	5 inch.	Fagging	$45.00	Failing	$125.00
5	6 "	2½ "	2 "	5 "	Fagot	50.00	Fainted	175.00

* Fitted for both Iron Pipe and Hose, as listed, but will be fitted for Lead Pipe when so ordered.

THE "TRIUMPH"
Double-Acting Force Pump.

FOR HAND OR POWER.

WITH AIR CHAMBER AND BRASS-LINED CYLINDER.

FIG. 605.

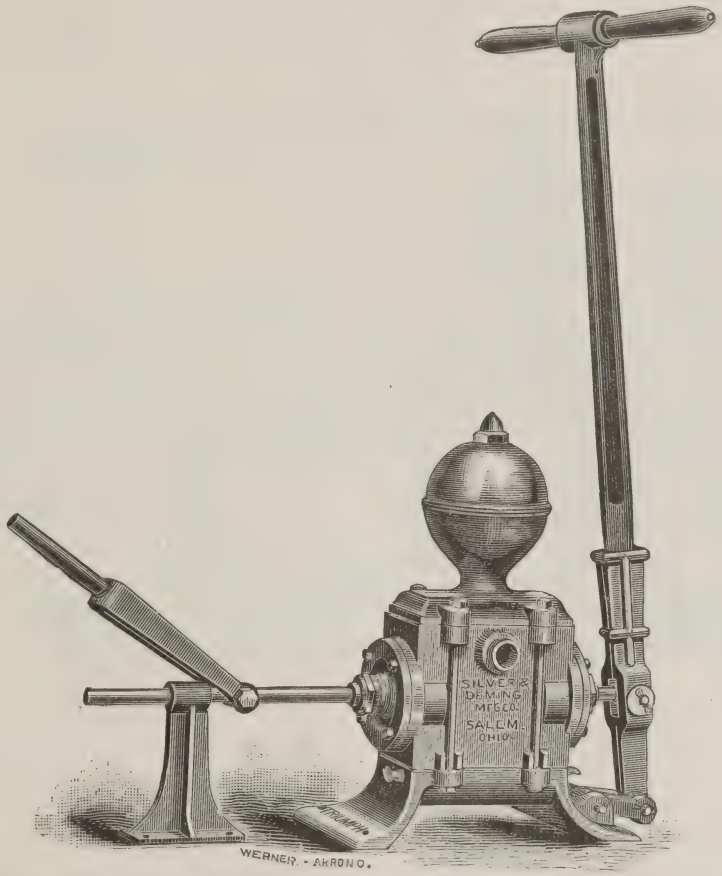


Fig. 605, represented by the above cut, is our "Triumph" Horizontal Double-acting Force Pump, arranged with both Lever for hand, and Pitman with guide, for power. This Pump is constructed in the same manner as **Fig. 601,** with the addition of double Piston-rod with power attachment at one end, and Lever for hand at the other. It is a very efficient Pump for either hand or power. Being a combined hand and power Pump its utility will be apparent.

The speed this Pump should be run is about fifty revolutions per minute. A malleable wrench furnished with each Pump.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	*Suction Fitted for	* Discharge Fitted for	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1¼ inch pipe.	1 inch pipe.	4½ inch.	Faintly	$35.00	Faithful	$ 85.00
2	3 "	1¼ " "	1 " "	4½ "	Faintness	40.00	Faithless	90.00
3	4 "	1½ " "	1¼ " "	4½ "	Fairing	45.00	Falcon	105.00
4	5 "	2 " "	1½ " "	5 "	Fairy	55.00	Fallacy	125.00

* Fitted for both Iron Pipe and Hose as listed, but will be fitted for Lead Pipe when so ordered.

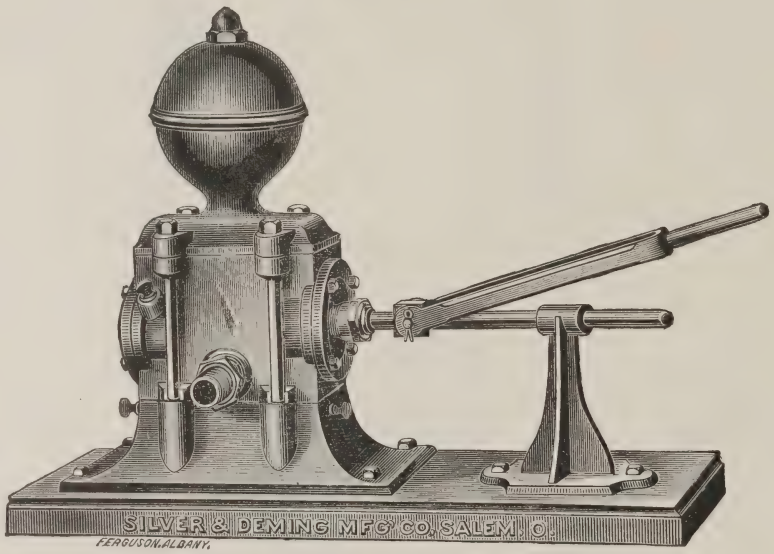
THE "TRIUMPH"

Double-Acting Force Pump.

FOR POWER.

WITH AIR CHAMBER AND BRASS-LINED CYLINDER.

FIG. 603.



The annexed cut represents **Fig. 603**, our "Triumph" Double-Acting Force Pump arranged for power. It is mounted on plank, with Rod Guide and Pitman for attaching to Crank Pin or Face Plate. This Pump, like **Fig. 605**, is made with Brass-lined Cylinder; the Valves, Valve Seats, Piston-rod, Plunger and other parts coming in contact with the water being made of Bronze Metal. For use in Railroad Stations, Factories, Breweries, Distilleries, etc., this Pump will be found very efficient and reliable.

The speed for this Pump is about fifty revolutions per minute. Drip-cocks and primer on each Pump. Always furnished with malleable wrench.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	* Suction Fitted for	*Discharge Fitted for	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
1	2½ inch.	1¼ inch pipe.	1 inch pipe.	4½ inch.	Fallible	$30.00	Familiar	$80.00
2	3 "	1¼ " "	1 " "	4½ "	Falsetto	30.00	Family	80.00
3	4 "	1½ " "	1¼ " "	4½ "	Falsify	32.00	Famish	95.00
4	5 "	2 " "	1½ " "	5 "	Falter	50.00	Fanatic	120.00
5	6 "	2½ " "	2 " "	5 "	Falling	55.00	Fantasy	170.00

* Fitted for Iron Pipe and Hose as listed, but will be fitted for Lead Pipe if so ordered.

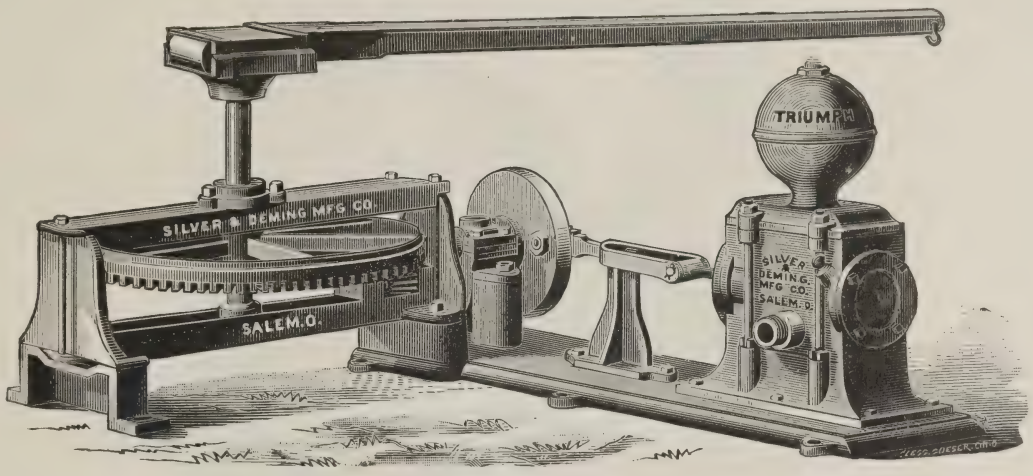
THE "TRIUMPH"

Double-Acting Force Pump.

COMBINED WITH HORSE POWER.

WITH AIR CHAMBER AND BRASS-LINED CYLINDER.

FIG. 613.



The cut on this page represents **Fig. 613**, a Horse Power and Pump combined. The Pump is similar to **Fig. 603**, and the Pitman is attached to a Horse Power, making the entire apparatus a desirable arrangement for pumping from shallow wells or streams, for irrigating and other purposes, where steam power is too expensive or not easily accessible.

The working parts of the Pump are the same as **Figs. 601, 602 and 603**, *i. e.*, the Cylinder is Brass-lined, the Plunger, Piston-rod, Valves, and Valve Seats are Brass. The Pump and Horse Power are attached to a substantial iron platform. Drip-cocks are provided for draining the Pump to prevent freezing. Malleable wrench furnished with each of these Pumps. This Pump should be run at a speed of about fifty to eighty revolutions per minute.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	* Suction Fitted for	* Discharge Fitted for	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
3	4 inch.	1½ inch pipe.	1¼ inch pipe.	4½ inch.	Fancier	$150.00	Fantastic	$215.00
4	5 "	2 " "	1½ " "	5 "	Fanciful	175.00	Farcical	250.00
5	6 "	2½ " "	2 " "	5 "	Fandango	190.00	Farewell	300.00

* Fitted for Iron Pipe and Hose, unless ordered for Lead Pipe.

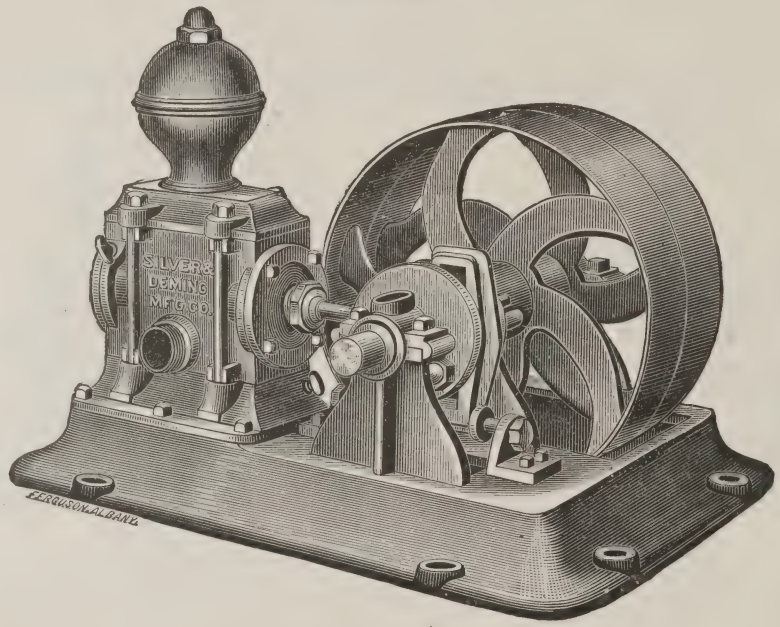
THE "TRIUMPH"

Double-Acting Force Pump.

ON IRON FRAME.

WITH AIR CHAMBER, BRASS-LINED CYLINDER, AND PULLEYS FOR POWER.

FIG. 604.



The above cut represents **Fig. 604**, the "Triumph" Double-acting Force Pump, arranged on a heavy iron frame for power, with Tight and Loose Pulleys, Crank Pin and Cross Head. This arrangement makes the most compact and substantial Pump of its class; and we can give it an unqualified recommendation for pumping water, oil, fermented or acetous liquors; also for Fire Protection, or for any purpose where a continuous and powerful stream is required.

This Pump is well adapted for the use of manufacturers in pumping into an elevated tank, or wherever the Pump has to work against a heavy pressure. In **Fig. 604**, all parts are constructed in the most substantial manner and of the best material; the Crank Pin is made of cast-steel, the Cylinder is brass-lined, the Valves and Valve Seats, Piston-rod and bearing block of the Crank Pin are made of Bronze or Gun Metal.

This Pump is guaranteed to work against a pressure of one hundred pounds to the square inch. The proper speed is about fifty revolutions per minute, though it may be run as high as eighty revolutions per minute; depending on the height it must pump, or the pressure it is working against.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	*Suction Fitted for	* Discharge Fitted for	Stroke.	Pulleys.	IRON.		BRASS.	
						Cipher.	Price.	Cipher.	Price.
2	3 inch.	1¼ inch pipe.	1 inch pipe.	4½ inch.	18x4	Fatal	$70.00	Fathom	$120.00
3	4 "	1½ " "	1¼ " "	4½ "	18x4	Fatality	75.00	Fatigue	135.00

Extra for Cranks to work by hand, $2.00 net.

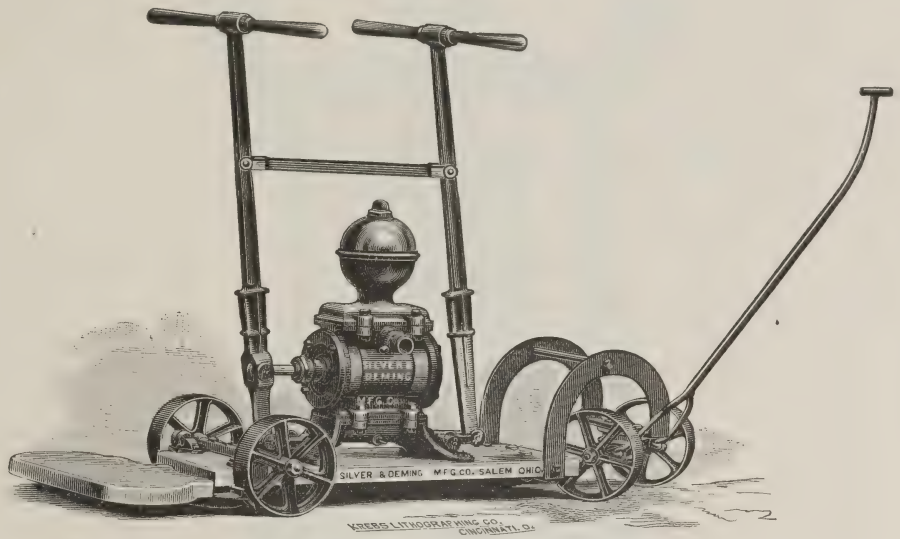
* Fitted for Iron Pipe and Hose as listed, but fitted for Lead Pipe, when so ordered.

"Triumph" Protection Fire Pump.

ON PORTABLE PLATFORM.

WITH DOUBLE LEVERS AND BRASS-LINED CYLINDER.

FIG. 606.



The above cut represents our "Triumph" Protection Fire Pump mounted on a Truck convenient for use about Factories, Warehouses, etc. This is without doubt the most effectual apparatus of the kind ever offered for sale. It can easily be drawn by one or two men; the fifth wheel to the front axle making it possible to turn short corners with facility.

When arranged with several feet of Suction Hose and the Discharge Hose necessary, it is quite as efficient as the more expensive Hand Fire Engines in general use for Village Fire Protection.

The small cost of this Pump makes it possible to have several of them conveniently located at different points. They can be readily got to a fire, and can be placed anywhere that water is obtainable, and, if necessary, inside of a house. One man can operate this Pump, and from two to six men can work on the brakes at once, if desirable.

For large warehouses, factories, public institutions and villages, where a cheap and effective system of Fire Protection is desired, the "Triumph" Fire Pump has no superior.

As in our "Triumph" Pumps for other purposes the Cylinder of **Fig. 606** is brass-lined, and the Valves, Valve Seats, Plunger and Piston-rod are brass or bronze metal.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

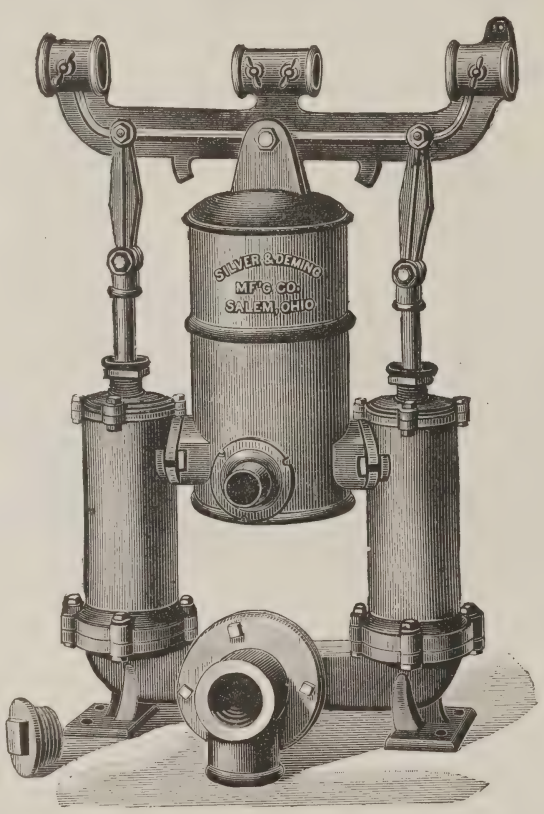
No.	Size Cylinder.	*Suction Fitted for	*Discharge Fitted for	Stroke.	IRON.		BRASS.	
					Cipher.	Price.	Cipher.	Price.
4	5 inch.	2 inch hose.	1½ inch hose.	5 inch.	Favor	$70 00	Fealty.	$150.00
5	6 "	2½ " "	2 " "	5 "	Favored	75.00	Fearful.	200.00

* Always fitted for Hose unless especially ordered for Iron or Lead Pipe. For price lists of Hose Brass Goods and Hose, see pages 171 and 172.

IMPROVED
Two-Cylinder Force Pump.

WITH WOOD LEVERS.

FIG. 615.



The above cut represents **Fig. 615**, a Two-cylinder Force Pump, which has been long and favorably known as a very efficient Fire Pump for use about Factories, Warehouses, Railroad Stations and other places where fire protection is required. This Pump is also in great favor as a Deck Pump on lake and river vessels. The Air Chamber of this Pump is large, which, in connection with the double Cylinders, causes the discharge of a continuous stream of water. To prevent freezing, raise the levers alternately to their extreme height, which trips the valves and allows the water to flow back.

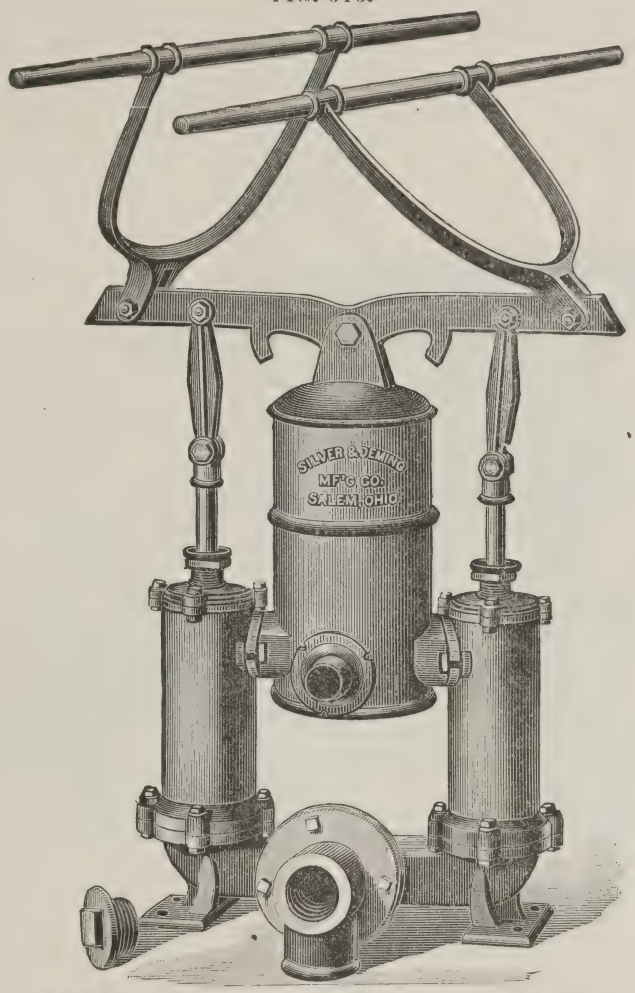
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cylinder.	Suction Fitted for	Discharge Fitted for	Stroke.	Capacity per Revolution.	IRON.		BRASS CYL.	
						Cipher.	Price.	Cipher.	Price.
1	2½ inch.	2 inch pipe.	1¼ in. hose.	6 inch.	.25 gal.	Feasible	$ 38.00	Federal	$ 60.00
2	3 "	2 " "	1¼ " "	6 "	.38 "	Feasted	40.00	Federate	65.00
3	3½ "	2½ " "	1½ " "	6 "	.50 "	Feaster	47.00	Federation	78.00
4	4 "	2½ " "	1½ " "	6 "	.65 "	Feasting	55 00	Feeble	95.00
5	4½ "	3 " "	2 " "	6 "	.83 "	Feather	70.00	Feeler	115.00
6	6 "	4 " "	3 " "	8 "	1.96 "	Feature	110.00	Feeling	170.00

IMPROVED
Two-Cylinder Force Pump.

FIG. 616.



The cut on this page represents **Fig. 616**, which is identical in construction with **Fig. 615**, except in the Brakes or Levers. The cuts represent accurately the construction of each of these Pumps.

This Pump furnished, when so ordered, on Truck, same as shown on page 133 (**Fig. 606**), and is designated as **Fig. 617**, the list of which we give below in connection with that of **Fig. 616.**

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

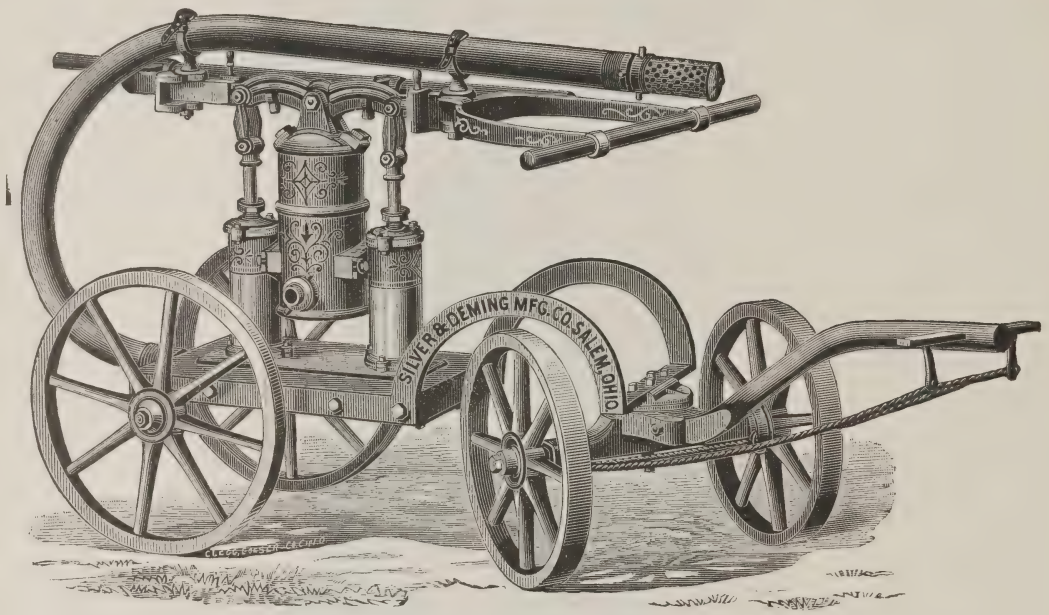
No.	Size Cylinder.	Suction Fitted for Hose.	Discharge Fitted for Hose.	Stroke.	FIGURE 616.				FIGURE 617.			
					IRON.		BRASS CYL.		IRON.		BRASS CYL.	
					Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1	2½ inch.	2 inch.	1¼ inch.	6 inch.	Feign	$58.00	Fence	$80.00	Ferment	$83.00	Fertility	$105.00
2	3 "	2 "	1¼ "	6 "	Fellah	60.00	Fellow	85.00	Feral	85.00	Ferrara	110.00
3	3½ "	2½ "	1½ "	6 "	Feigned	67.00	Fencible	98.00	Ferocity	92.00	Fertilize	128.00
4	4 "	2½ "	1½ "	6 "	Feline	75.00	Fencing	115.00	Ferret	100.00	Fervid	140.00
5	4½ "	3 "	2 "	6 "	Felony	90.00	Fender	135,00	Ferry	115.00	Fervor	160.00
6	6 "	4 "	3 "	8 "	Feminine	130.00	Fennel	190.00	Fertile	155.00	Festal	215.00

IMPROVED

"Swan-Neck" Village Fire Engine.

WITH GUN-METAL CYLINDERS.

FIG. 618.



The above cut represents a Swan-neck style of Village Fire Engine which we are building in two sizes. These Engines are made in the most substantial manner, with reversible and folding brakes, arranged so that ten or twelve men can work on them at once. The Pump Cylinders are made of gun metal, with valves of the most approved pattern, which allow a free passage of the water through them.

The fifth wheel to the truck allows of turning the shortest corners. The Pump has two Cylinders, and a large Air Chamber, giving a continuous stream of water. The prices do not include Hose, which is extra. Prices on Hose, Couplings, Nozzles, etc., on pages 171 and 172.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

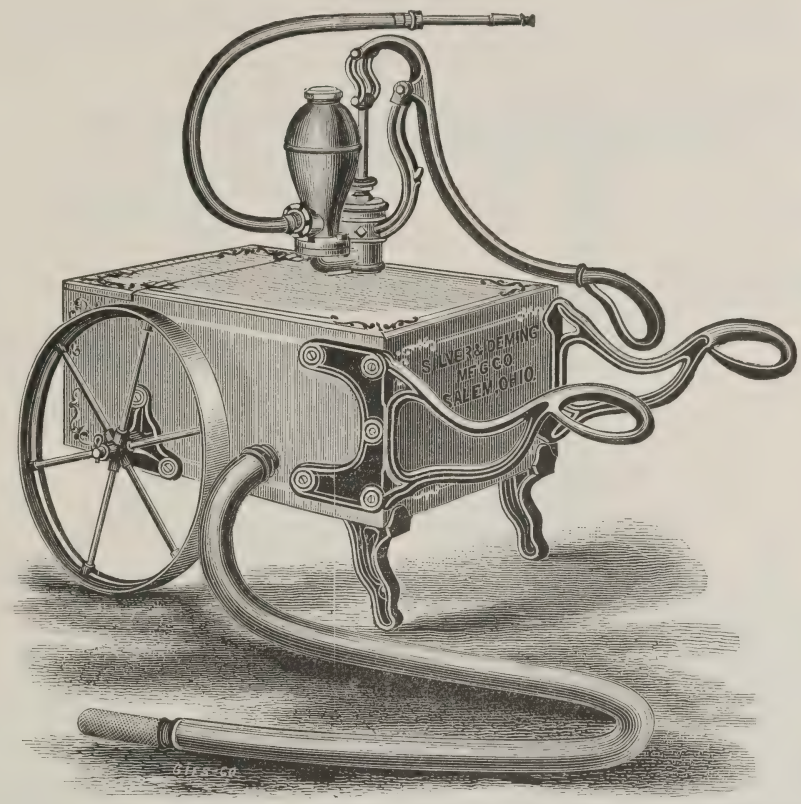
Sizes and Prices.

No.	Size Cylinders.	Suction Fitted for	Discharge Fitted for	Stroke.	Capacity per Revolution.	Cipher.	Price.
4	4½ inch.	2½ inch hose.	1½ inch hose.	6 inch.	.83 gal.	Festive	$200.00
5	6 "	3 " "	2 " "	8 "	1.96 "	Festoon	275.00

PORTABLE
Garden and Fire Pump.

WITH RESERVOIR AND SUCTION HOSE ATTACHMENT.

FIG. 651.



The above cut represents our **Fig. 651,** a Portable Garden and Fire Pump, with Reservoir and Suction Hose attachment. This Pump is extensively employed by gardeners, fruit growers, nurserymen and others who can use an apparatus of this description to advantage, for such work as sprinkling lawns, flower and vegetable gardens, fruit trees, and for washing carriages, windows, etc.

The tank or reservoir will hold about a barrel of water, which in many cases would be enough to extinguish a fire that might result disastrously.

Fig. 651, is furnished with *three feet of hose* and *discharge nozzle*, with either Wood or Iron Handles, and with or without Suction Hose attachment, as listed below. With the Suction Hose the water may be taken from a cistern, spring, creek, or other available source.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 651.	Size Pump Cyl.	*Suction Fitted for	*Discharge Fitted for	Stroke.	IRON HANDLES.		WOOD HANDLES.	
					Cipher.	Price.	Cipher.	Price.
With suction hose attach't	3 inch.	1½ in. hose.	1 in. hose.	6 inch.	Fetlock	$29.00	Feudal	$28.00
Without suction hose "	3 "	1½ " "	1 " "	6 "	Fetter	26.00	Feverish	25.00

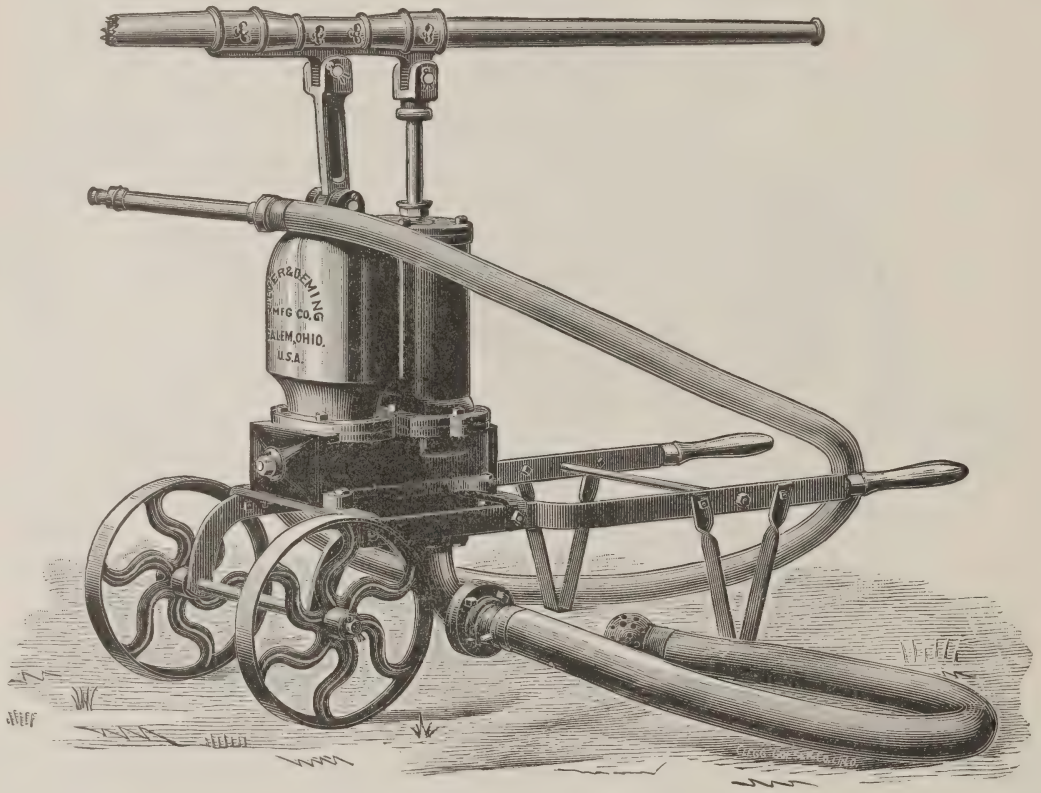
* Suction Hose is not included in above prices. Three feet Discharge Hose and Nozzle are furnished at prices above. Price Lists of Hose and Hose Goods on pages 171 and 172. Lead-lined Tanks, $5.00 net extra; Galvanized Iron-lined Tanks, $3.00 net extra.

SPECIAL
Double-Acting Force Pump.

ON WROUGHT-IRON BARROW.

WITH BRASS-LINED CYLINDER, RUBBER BALL VALVES, AND WOOD LEVERS.

FIG. 620.



The illustration on this page represents a Double-acting Lift and Force Pump of peculiar construction, mounted on a Wrought-iron Barrow, with Wood Levers. The water-ways are large and direct, which facilitates the working of the Pump. It is simple and compact. The valves may be reached by unscrewing the nut of a bolt, which holds in place a door at either end of the combined valve chamber and bed plate.

With the Wood Levers from two to six men can operate this Pump at once. Its compactness and adaptability to a variety of purposes make it a very desirable Pump. It is excellent as a Fire Pump, as well as for irrigating purposes, where ditches and streams are available.

As listed, **Fig. 620** is furnished with six feet of two inch spiral wire Suction Hose, twelve feet of 1½ inch Discharge Hose, Brass Hose Nozzle and Spray, Hose Couplings, Suction Strainer, etc.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 620.	Pump Cyl.	Suction Fitted For	Discharge Fitted For	Stroke.	Weight.	Cipher.	Price.
Complete as shown in cut.	5 inch.	2 inch hose.	1½ inch hose.	8 inch.	300 lbs.	Fickle	$58.00

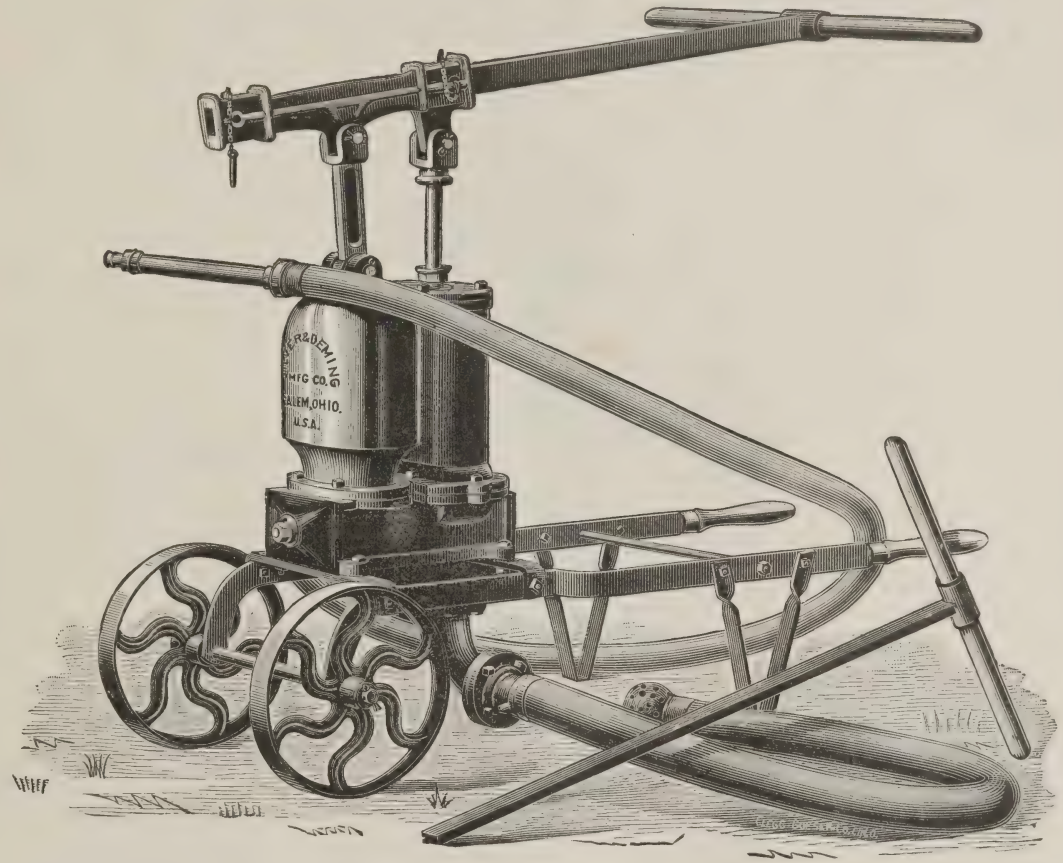
Price Lists of Hose Goods and Hose, on pages 171 and 172.

SPECIAL
Double-Acting Force Pump.

ON WROUGHT-IRON BARROW.

WITH BRASS-LINED CYLINDER, RUBBER BALL VALVES AND IRON LEVERS.

FIG. 621.



The Pump illustrated above is the same in every particular as the one on preceding page, with the exception that **Fig. 621,** is provided with Wrought-iron Levers having adjustable wood brakes at the end, by means of which from four to eight men can work at pumping together. This gives **Fig. 621** greater capacity than **Fig. 620,** and it is therefore preferable for some purposes.

The price list includes the Pump complete, as shown in cut, with six feet of two inch Spiral Suction Hose, and twelve feet of 1½ inch Discharge Hose, Brass Hose Nozzle and Spray, Hose Couplings, Suction Strainer, etc.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

Fig. 621.	Pump Cyl.	Suction Fitted For	Discharge Fitted For	Stroke.	Weight.	Cipher.	Price.
Complete as shown in cut.	5 inch.	2 inch hose.	1½ inch hose.	8 inch.	340 lbs.	Fiction	$64.00

Price Lists of Hose Goods, Hose, etc., on pages 171 and 172.

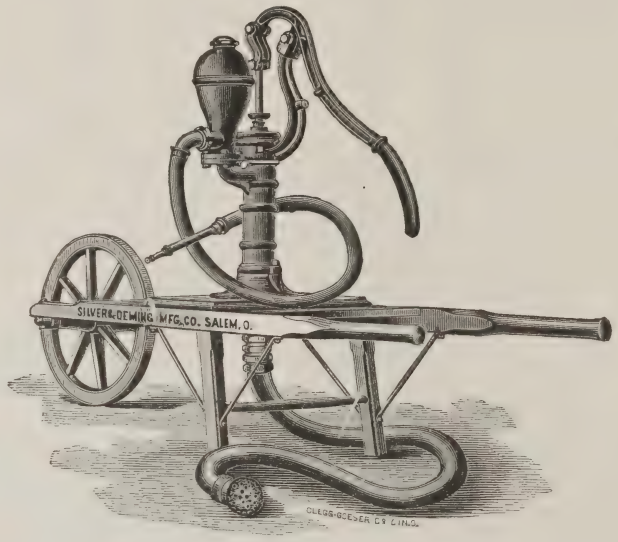
SPECIAL

Garden Hand Force Pump.

ON WOOD BARROW.

WITH SUCTION AND DISCHARGE HOSE.

FIG. 513.



The Pump represented by the above cut, is the same as our Hand Force Pump, **Fig. 510**, on a Wooden Barrow, with Suction and Discharge Hose, for watering gardens, sprinkling lawns, etc. Where irrigating ditches and streams exist this Pump will be found quite effective. It can readily be moved from place to place: or the Pump can be easily disconnected from the barrow and used for other purposes if desirable.

As a Pump for fire protection, **Fi5. 513** may be made to do good service.

The prices below include six feet of 1¼ inch Suction Hose, and three feet of Discharge Hose; also, Hose Couplings, Nozzle, Suction Strainer, etc. List of this Pump without Barrow and Hose (**Fig. 510**), on page 100.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Pump Cyl.	Suction Fitted For	Discharge Fitted For	Stroke.	IRON PUMP.		BRASS CYL. PUMP.	
					Cipher.	Price.	Cipher.	Price.
2	2½ inch.	1¼ inch hose.	1 inch hose.	6 inch.	Fiddle	$23.00	Fidget	$28.00
4	3 "	1¼ " "	1 " "	6 "	Fidelity	26.50	Fighter	32.00

Additional Hose Goods furnished, when ordered. See pages 171 and 172.

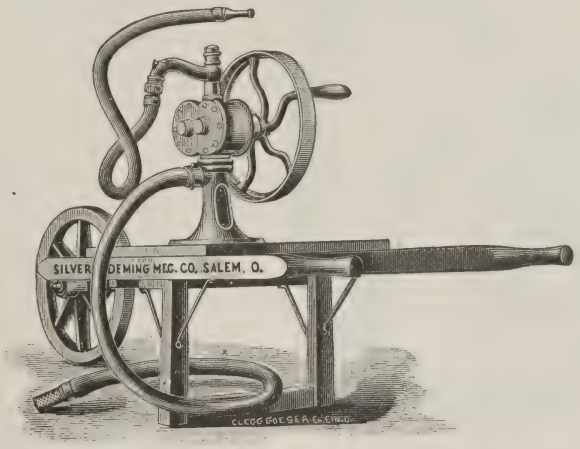
SPECIAL

Garden Rotary Force Pump.

ON WOOD BARROW.

WITH SUCTION AND DISCHARGE HOSE.

FIG. 573.



The above cut represents a Rotary Pump mounted on a Wooden Barrow, similar to **Fig. 513**, so that it can be moved from place to place with ease.

As in **Fig. 513**, this Pump can be detached from the Barrow and used for any desired purpose.

In establishments where a portable Pump is needed, and for use in orchards, gardens, for irrigating, etc., it will be found a very serviceable article. Six feet of Suction Hose with Strainer, and three feet of Discharge Hose with Nozzle, accompany each Pump.

List of this Pump, without Barrow and Hose (**Fig. 575**), on the following page.

Sizes and Prices.

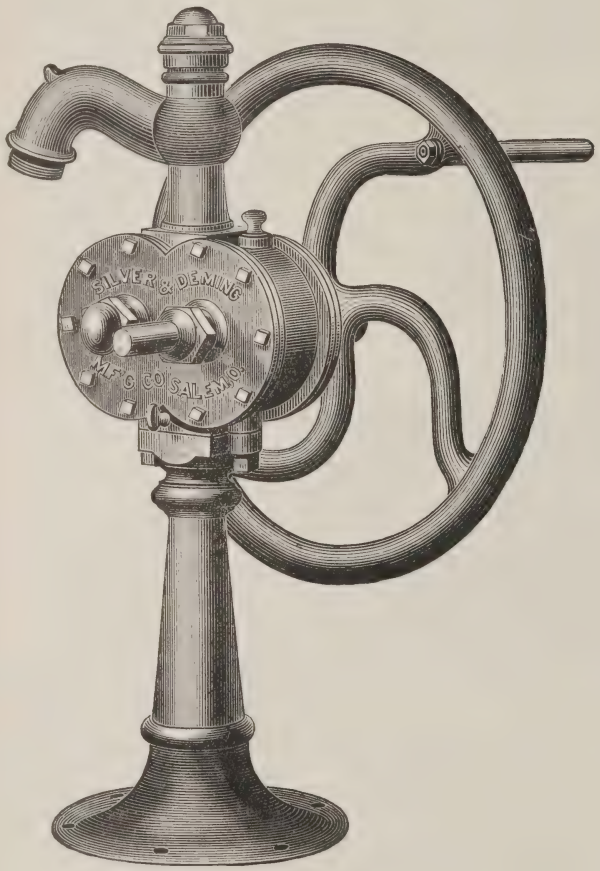
No.	Suction Fitted for	Discharge Fitted for	At 100 Revolutions per Minute.	IRON PUMP.		BRONZE PUMP.	
				Cipher.	Price.	Cipher.	Price.
1	1¼ inch hose.	1 inch hose.	Discharges 13 gallons.	Gable	$29.50	Gainsay	$51.50
2	1¼ " "	1 " "	" 14 "	Gadding	32.50	Gaiter	56.50
3	1½ " "	1¼ " "	" 17 "	Gaelic	36.50	Galaxy	61.50
4	1½ " "	1½ " "	" 27 "	Gaggle	46.00	Gallant	76.00
5	2 " "	2 " "	" 36 "	Gaily	52.00	Galling	87.00

Additional Hose goods furnished, when ordered. See pages 171 and 172.

IMPROVED
Hand Rotary Force Pump.

WITH FLY-WHEEL AND CRANK.

FIG. 575.



The cut above illustrates **Fig. 575**, our Hand Rotary Force Pump, with heavy Fly-wheel. This is a positive Suction and Force Pump, metallic fitted; especially adapting it for the requirements of Brewers, Wine Producers, Distillers, Gas Companies, etc.

Our Rotary Pumps are constructed with the greatest care, the Cases and Cams of each size being made to exact gauges and templets. The peculiar construction of the Rotary Pump requires the utmost accuracy in fitting every part. Through long experience we have arrived at the best form for constructing the Cams, or Rotary Pistons in these Pumps, and we can fully recommend them for lifting water by suction and discharging it at an elevated point the same as a Piston Pump.

For pumping oil, fermented and acetous liquids, the Pump is very efficient; and for pumping hot or cold water it can be used in place of the ordinary Piston Pumps. When used for pumping acids the working parts should be made of Bronze Metal. For pumping hot liquids we arrange it with a Metallic Check Valve, without extra charge.

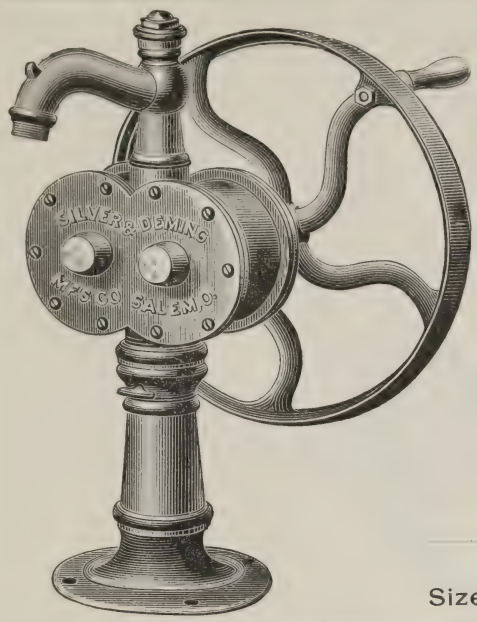
Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	†Suction Fitted for	†Discharge Fitted for	At 100 Revolutions per Minute.	IRON. Cipher.	IRON. Price.	* BRONZE. Cipher.	* BRONZE. Price.
1	1¼ inch.	1 inch.	Discharges 13 gallons.	Gallantry	$20.00	Gammon	$42.00
2	1¼ "	1 "	" 14 "	Gallery	23.00	Gander	47.00
3	1½ "	1¼ "	" 17 "	Gallop	27.00	Gangrene	52 00
4	1½ "	1½ "	" 27 "	Gallows	35.00	Gangway	65.00
5	2 "	2 "	" 36 "	Gambol	40.00	Gargle	75.00
6	3 "	2½ "	" 55 "	Gamester	50.00	Gargoyle	95.00

† The Pumps are fitted for Iron Pipe, but will be fitted for Lead Pipe or Hose, when so ordered.

* The Bronze Pumps are all Bronze Metal, except Base and Fly-wheel.



ROTARY
Force Pump.

WITH LIGHT FLY-WHEEL.

FIG. 574.

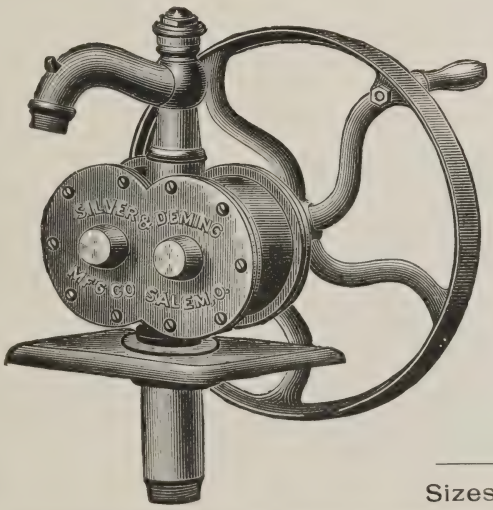
This cut represents **Fig. 574**, a Rotary Force Pump, in all respects similar to **Fig. 575**, except that the Fly-wheel is lighter and the base is shorter than in **Fig. 575**.

This Pump is fitted the same as **Fig. 575**, for Iron Pipe, but can be arranged for Lead Pipe or Hose when so ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Suction Fitted For	Discharge Fitted For	At 100 Revolutions per Minute.	IRON.		*BRONZE.	
				Cipher.	Price.	Cipher.	Price.
1	1¼ inch pipe.	1 inch pipe.	Discharges 13 gal.	Garnishee	$19.00	Garretting	$41.00
2	1¼ " "	1 " "	" 14 "	Garniture	22.00	Gashed	46.00
3	1½ " "	1¼ " "	" 17 "	Garretted	26.00	Gashing	51.00



ROTARY
Force Pump.

ON FLAT BASE.

WITH LIGHT FLY-WHEEL.

FIG. 578.

The annexed cut represents our **Fig. 578**, a Rotary Force Pump with Flat Base and Light Fly-wheel, arranged for bolting to a bench or table.

The Base of this Pump is flat and square, with a cast hub projecting below. In its working parts, **Fig. 578** is the same as **Figs. 574 and 575.**

Both the suction and discharge are fitted for Hose Couplings, but will be fitted for Iron or Lead Pipe if so ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Suction Fitted For	Discharge Fitted For	At 100 Revolutions per Minute.	IRON.		*BRONZE.	
				Cipher.	Price.	Cipher.	Price.
1	1¼ inch hose.	1 inch hose.	Discharges 13 gal.	Garland	$19.50	Gaulish	$41.50
2	1¼ " "	1 " "	" 14 "	Garlic	22.50	Garrison	46.50
3	1½ " "	1¼ " "	" 17 "	Garment	26.75	Garrulity	51.75
4	1½ " "	1½ " "	" 27 "	Garnet	36.50	Garrulous	67.00
5	2 " "	2 " "	" 36 "	Garnish	42.00	Garter	77.50

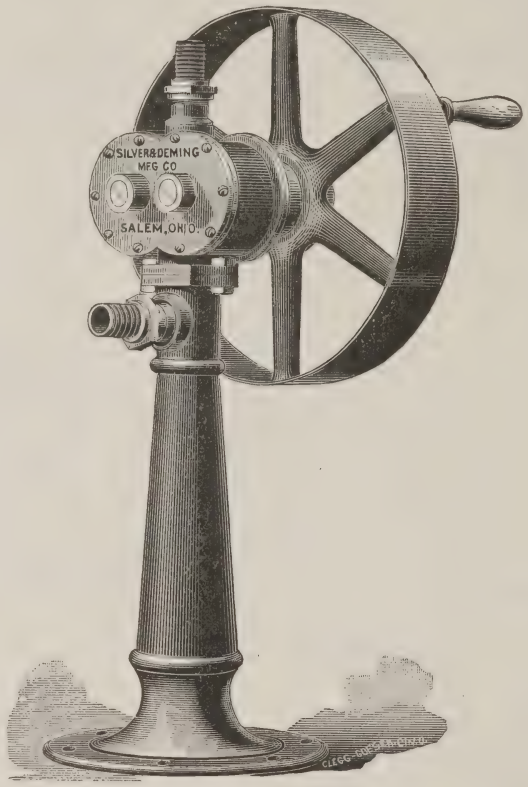
* The Bronze Pumps are all Bronze metal, except Base and Fly-wheel.

Special Rotary Force Pump.

FOR HAND OR POWER.

WITH FLY-WHEEL PULLEY AND HANDLE.

FIG. 579.



This Pump is the same in general construction as our other Rotary Force Pumps; the base however being taller and broader than in **Fig. 575**. This Pump has a Pulley eighteen inches in diameter, with 3½ inch face, provided with a handle so that it can be operated either by hand or power as desired. It is adapted for pumping all kinds of liquids, but is especially intended for the use of Wine and Cider Producers; the Bronze Pumps being best suited for this purpose. **Fig. 579** has a side suction and upward discharge, which are always fitted for Hose, unless otherwise ordered. When so ordered, we can fit both suction and discharge for Iron Pipe.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

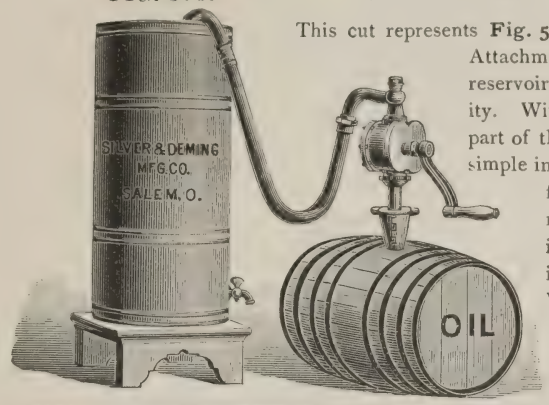
Sizes and Prices.

No.	Suction Fitted for	Discharge Fitted for	Fly-Wheel Pulley.	At 100 Revolutions per Minute.	IRON.		*BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	1¼ inch hose.	1 inch hose.	18x3½	Discharges 13 gal.	Gaudy	$22.00	Gavel	$45.00
2	1¼ " "	1 " "	18x3½	" 14 "	Gauger	25.00	Gawkey	50.00
3	1½ " "	1¼ " "	18x3½	" 17 "	Gauntlet	30.00	Gazelle	56.00

* The Bronze Pumps are all Bronze Metal, except Base and Fly-wheel Pulley.

Hand Rotary Force Pump.

FIG. 576. **WITH BARREL ATTACHMENT.**



This cut represents **Fig. 576**, our Hand Rotary Force Pump, arranged with Barrel Attachment and Goose-neck Spout for discharging into a tank or reservoir. To dealers in oils and liquors this Pump is of great utility. With it the liquid can be transferred from the cellar to any part of the building. It is a positive Suction and Force Pump; is simple in construction and is easily operated. With each Pump is furnished a Goose-neck Spout attachment, Barrel attachment, with Suction Pipe three feet long, and Hook. Hose is not furnished with this Pump as listed, but we can furnish it in any lengths—see price-list of Hose on page 172. When ordered, we furnish Brass or Copper Suction Pipe.

Sizes and Prices.

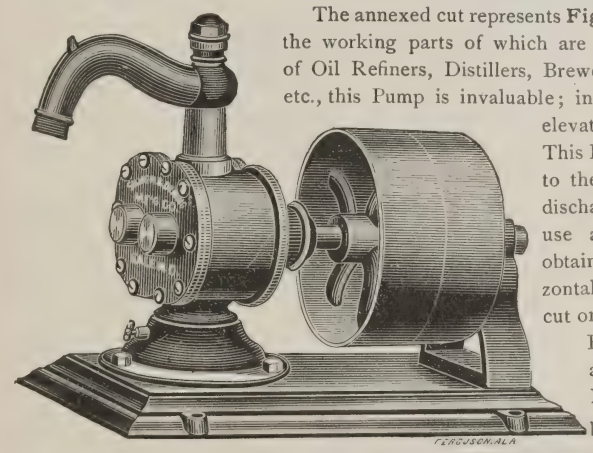
No.	Suction.	Discharge Fitted for	At 100 Revolutions per Minute.	IRON.		*BRONZE.	
				Cipher.	Price.	Cipher.	Price.
1	1 inch pipe.	1 inch hose.	Discharges 13 gallons.	Gaseous	$17.00	Gastric	$39.00
2	1 " "	1 " "	" 14 "	Gasometer	20.00	Gather	44.00
3	1¼ " "	1¼ " "	" 17 "	Gasped	24.00	Gathered	49.00

* The working parts of the Pump coming in contact with the liquid, are made of Bronze.

Power Rotary Force Pump,

ON FRAME.

FIG. 577. **WITH TIGHT AND LOOSE PULLEYS.**



The annexed cut represents **Fig. 577**, a Power Rotary Force Pump, **on Iron Frame**, the working parts of which are the same as **Figs. 574, 575, 578**, etc. For the use of Oil Refiners, Distillers, Brewers, Wine Producers, Varnish Makers, Meat Packers, etc., this Pump is invaluable; in fact, wherever water or other liquid must be rapidly elevated by power, **Fig. 577** will be found very serviceable. This Pump can be used against a pressure of fifty pounds to the square inch, which renders it particularly useful for discharging into an elevated tank, also as a Fire Pump, for use about Factories, Warehouses, etc., where power is obtainable. It will throw water from 100 to 150 feet horizontally. In discharging to a tank, the cap, as shown in cut on upward discharge, should be placed on the spout.

For pumping acids, the Bronze Pumps should be used, and when intended for hot liquids, they should have Metallic Check Valve. Drip-cocks are provided to prevent freezing.

Sizes and Prices.

No.	Suction Fitted for	Discharge Fitted for	Size Pulleys.	At 100 Revolutions per Minute.	IRON.		*BRONZE.	
					Cipher.	Price.	Cipher.	Price.
1	1¼ inch pipe	1 inch pipe.	7 x2½in.	Discharges 13 gal.	Gazetteer	$27.00	Genial	$49.00
2	1¼ " "	1 " "	7 x2½ "	" 14 "	Gelatine	32.00	Genitive	56.00
3	1½ " "	1¼ " "	7 x2½ "	" 17 "	Gender	38.00	Genius	63.00
4	1½ " "	1½ " "	11 x3 "	" 27 "	Generate	48.00	Genteel	78.00
5	2 " "	2 " "	11 x3 "	" 36 "	Generous	54.00	Gentility	90.00
6	3 " "	2½ " "	14½x4 "	" 55 "	Genesis	65.00	Gentleman	110.00

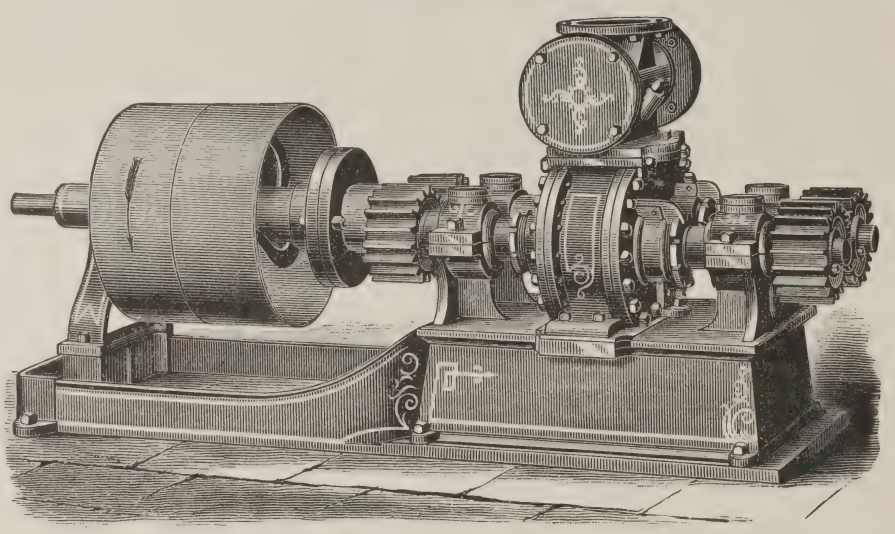
* All Bronze except Base, Platform, Pulleys, Bearings, etc.

IMPROVED

Power Rotary Force Pump.

WITH TIGHT AND LOOSE PULLEYS.

FIG. 594.



The above cut represents our Power Rotary Force Pump, **Fig. 594**, Nos. 2, 2½, 3 and 4, which are extensively used in supplying the different stories of large buildings with water, either direct or by distribution from a Tank or Reservoir under the roof. These Pumps are constructed in the most substantial manner; they are set on a Heavy Base and are so arranged that they can be readily bolted to a foundation or to the floor.

The Pump may be turned end for end on its Base, and the Counter-shaft removed to the opposite side of the Frame, and thus the Pump will operate with the belt running in the opposite direction to that shown in the cut.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

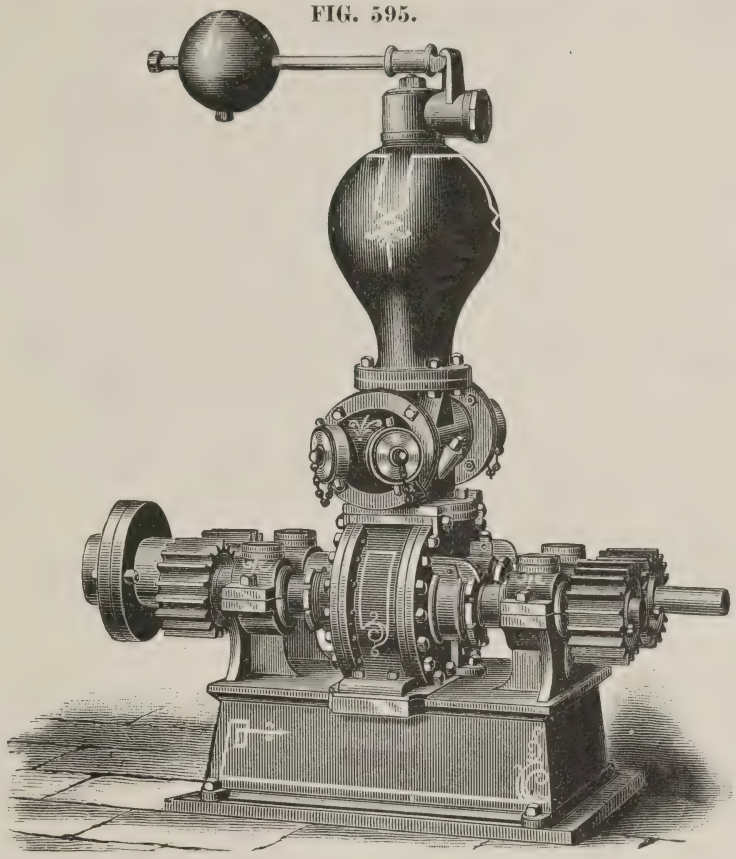
No.	Suction inches.	Discharge inches.	Capacity per Revolution.	Revolutions per Minute.	Size Base inches.	Size Pulleys inches.	Horse Power.	IRON.		BRONZE.	
								Cipher.	Price.	Cipher.	Price.
2	2½	2½	.20 gal.	175	11½x48	11½x2½	1.33	Genuine	$115.00	Ghastly	$ 180.00
2½	3¼	3¼	.50 "	150	12⅛x58½	15½x6	2.85	Geography	160.00	Giantess	260.00
3	4	4	.83 "	135	18 x63¾	15½x6	4.25	Geology	210.00	Giblet	400.00
4	4½	4½	1.25 "	110	20⅛x74½	22 x7	5.20	Geometric	245.00	Giddy	445.00
*5	6	5	2.00 "	100	21¼x35½	*No pulleys	7.60	Geometry	300.00	Gigantic	560.00
*6	8	8	5.50 "	90	25½x40½	*No pulleys	19.00	Gesture	575.00	Giggle	1,150.00
*7	9	9	7.33 "	80	25½x40½	*No pulleys	22.30	Geyser	650.00	Gilded	1,250.00

* Nos. 5, 6 and 7 are furnished without Pulleys and are arranged to be run by Coupling Gears or Clutch. They are similar to **Fig. 595** on next page, omitting the Air Chamber, Safety Valves and Hose Connections.

Power Rotary Fire Pump.

WITH COUPLING FOR GEARS OR CLUTCH.

FIG. 595.



The Pumps illustrated by the above cut, we build in seven different sizes. These Pumps are adapted especially for Fire Protection, and will throw from one to seven different streams to a considerable height.

The different floors of a building can, by use of one of these Pumps, be flooded by means of pipes from the Pump and "Cut-off's" for Hose on each floor. The water can be either drawn direct from Tanks, into which it is forced, or it can be forced direct from the Pump and drawn through Hydrants.

The medium size Pump will force a stream 200 to 250 feet from the nozzle, or four streams at once 150 feet each. These Pumps will draw water by suction about twenty-five to twenty-eight feet vertical distance.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

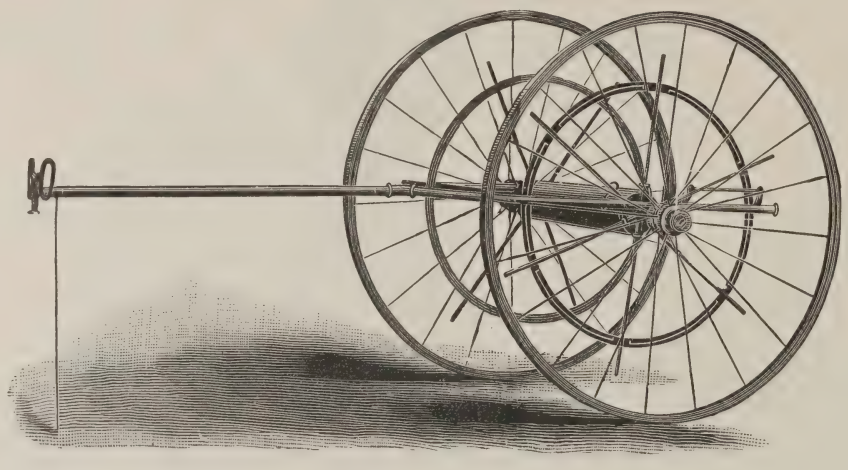
No.	Suction inches.	Discharge inches.	Capacity per Revolution.	Speed.	Number Streams.	Horse Power.	IRON, as per cut.		WITH PULLEYS, like Fig. 594.				
									Pulleys.	IRON.		BRONZE.	
							Cipher	Price.		Cipher.	Price.	Cipher.	Price.
2	2½	2½	.20 gal.	550	1	8.25	German	$115.00	14 x7	Ginseng	$125.00	Gimlet	$190.00
2½	3¼	3¼	.50 "	500	2	18.75	Germania	140.00	15½x10	Giraffe	175.00	Gipsy	275.00
3	4	4	.83 "	400	3	25.00	Giggled	200.00	20 x12	Girdle	225 00	Girded	425.00
4	4½	4½	1.25 "	350	4	32.77	Giggling	250.00	22 x14	Girlish	265.00	Giver	465.00
5	6	5	2.00 "	300	4	45.00	Gilding	350.00	. . . .	. . . .	. . .	. . .	. . .
6	8	8	5.50 "	225	6	92.78	Ginger	625.00	. . . .	. . . .	. . .	. . .	. . .
7	9	9	7.33 "	200	7	110.00	Gingham	700.00	. . . .	. . . .	. . .	. . .	. . .

IMPROVED

Fire Protection Hose Cart.

FOR MILLS AND FACTORIES.

FIG. 652.



The Hose Cart represented by the above cut is substantially made in every particular, and will be found a very useful article for fire protection about Factories, Public Buildings, Villages, etc., where volunteer fire companies exist. These Hose Carts can be used to advantage in connection with our Rotary Power Pumps, and Fire Pumps on Truck, illustrated and described on the preceding pages. We furnish these Carts with Steel Axles, and with either Bicycle Wheels with Steel Tires, or with Wooden Wheels, at prices given in the list below.

The frames are made of Wrought-iron Pipe, put together with special fittings; they are tastefully painted, and are neat in appearance, as well as light in weight, and easy to handle.

Sizes and Prices.

No.	Capacity of Rubber Hose.	Length of Cart.	Width of Cart.	Height of Cart.	BICYCLE WHEELS.		WOODEN WHEELS.	
					Cipher.	Price.	Cipher.	Price.
1	500 feet.	9 ft. 1 in.	4 ft. 11 in.	4 ft. 10 in.	Icelandic	$80.00	Identity	$80.00
2	300 "	8 " ½ "	4 " 5 "	4 " 0 "	Iconoclast	60.00	Idiotic	60.00
3	200 "	7 " 4 "	4 " 5 "	3 " 6 "	Idealism	50.00	Idolatry	50.00

Rubber Hose furnished to order. Price lists of Brass Goods, Hose, etc., will be found on pages 171 and 172.

"Ajax" Power Force Pump.

WITH TIGHT AND LOOSE PULLEYS.

FIG. 583.

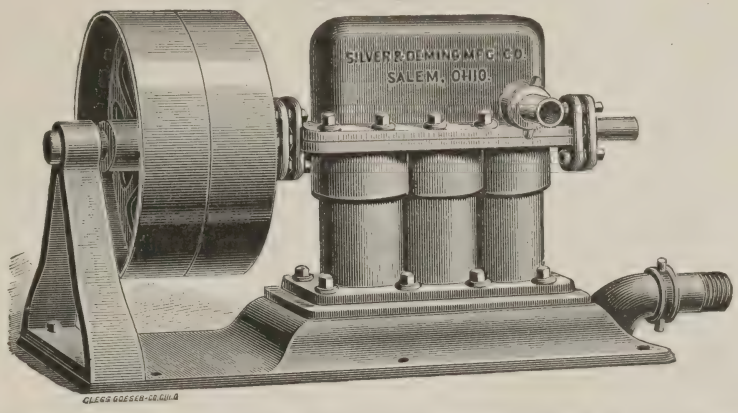


Fig. 583 is a Power Force Pump, constructed with three Cylinders, operated by an Eccentric Cast-steel Shaft. This gives three times the capacity of a Single-acting Pump. For fire purposes this Pump has no superior, as it can be run as high as 100 revolutions per minute. It will discharge water at an elevation against a heavy pressure, and will throw an absolutely continuous stream. The Suction is common to the three Cylinders, being located in the Base or Frame, and the discharge is at the side of the Air Chamber.

Sizes and Prices.

No.	Size Cylinder.	Suction Fitted for	Discharge Fitted for	Stroke.	Size Pulleys.	Cipher.	Price.
4	3 inch.	2 inch pipe.	1½ inch pipe.	2½ inch.	12 x 3 inch.	Gracious	$ 55.00
6	4 "	2½ " "	2 " "	5 "	12 x 4 "	Graduate	150.00

IMPROVED
Sewage and Quarry Pump.

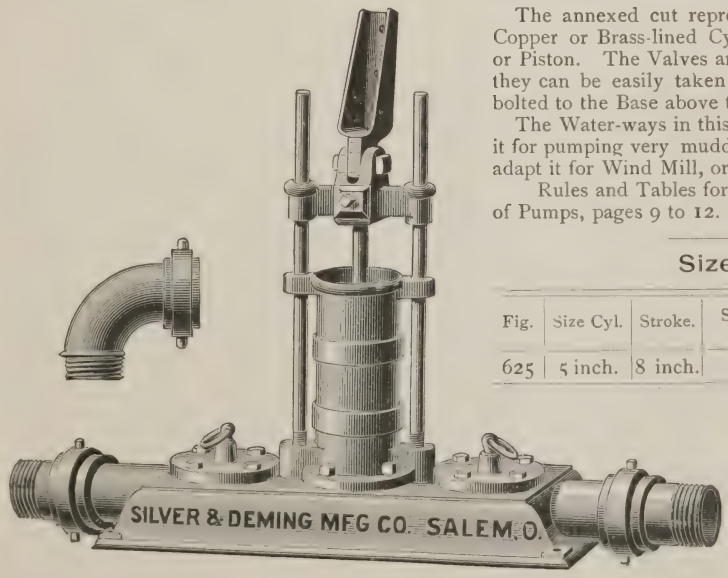


FIG. 625.

The annexed cut represents **Fig. 625**, a Force Pump, with Copper or Brass-lined Cylinder, and Gun Metal solid Plunger or Piston. The Valves are arranged on an inclined seat, so that they can be easily taken out for repairing, by detaching a cap bolted to the Base above the Valve.

The Water-ways in this Pump are large and direct, adapting it for pumping very muddy water. The Pitman and Guides adapt it for Wind Mill, or other power.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

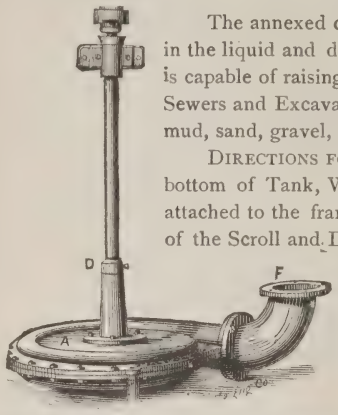
Size and Price.

Fig.	Size Cyl.	Stroke.	Suction and Discharge.	Cipher.	Price.
625	5 inch.	8 inch.	3 inch.	Gummy	$100.00

N. B.—The Coupling represented by the detached cut is furnished so that the suction can be placed downward at the Pump if desired. Fitted for Iron Pipe or Hose, as ordered.

Vertical Centrifugal Pump.

FIG. 596. **WITH SUBMERGED PISTON WHEEL.**



The annexed cut represents **Fig. 596**, our Improved Vertical Centrifugal Pump. Submerged in the liquid and driven as directed, this Pump needs no priming; is always ready for service, and is capable of raising enormous quantities of water in draining Lock-pits, Coffer-dams, Stone-quarries, Sewers and Excavations of various kinds. Having no valves, it will readily raise water containing mud, sand, gravel, tan-bark, paper-pulp and other like substances.

DIRECTIONS FOR OPERATING:—Secure the Pump so that each leg has a perfect bearing on the bottom of Tank, Well, Excavation or Platform, as the case may be, and see that the Shaft when attached to the frame work turns easily, secure the Pulley and arrange to drive it in the direction of the Scroll and Discharge. The driving shaft may run in either direction, as the quarter turn or twist in the belt can be made to suit the requirements of the Pump. If necessary a Guide Pulley may be placed near Pulley on Upright Shaft, above or below, as the case may require.

Sizes and Prices.

No.	Diameter Discharge Pipe.	Capacity per Minute.	IRON.		BRASS.	
			Cipher.	Price.	Cipher.	Price.
1½	1½ inch.	175 gallons.	Giving	$30.00	Glazier	$55.00
1¾	1¾ "	250 "	Gizzard	40.00	Glazed	90.00
2	2 "	350 "	Glacial	60 00	Gleamed	110.00
2½	2½ "	400 "	Glacier	70.00	Gleaming	135.00
3	3 "	675 "	Gladden	75.00	Gleeful	150.00
4	4 "	1300 "	Gladiator	110.00	Glimmer	240.00
5	5 "	1900 "	Gladly	140.00	Glimpse	315.00
6	6 "	2700 "	Gladness	170.00	Glisten	360.00
8	8 "	4800 "	Glamour	265.00	. . . . .	. . . . .
10	10 "	7500 "	Glance	330.00	. . . . .	. . . . .
12	12 "	10500 "	Glancing	420.00	. . . . .	. . . . .
15	15 "	16500 "	Glaring.	600.00	. . . . .	. . . . .
22	22 "	35000 "	Glassy	1,200.00	. . . . .	. . . . .

Increasing the speed of a Centrifugal Pump increases its capacity and the height to which it will raise water. See table below.

Table Showing Capacity and Speed of Centrifugal Pumps.

No.	Diameter Discharge Pipe.	Capacity per Minute.	Size Pulleys.		Revolutions per Minute necessary to Raise Water a given Height in feet.									
			Diam.	Face.	5 ft.	10 ft.	15 ft.	20 ft.	25 ft.	30 ft.	35 ft.	40 ft.	50 ft.	100 ft.
1½	1½ inch.	175 gal.	5 in.	5 in.	626	725	828	916	1008	1081	1160	1222	1350	1865
1¾	1¾ "	250 "	5 "	5 "	598	723	819	900	975	1042	1110	1168	1282	1760
2	2 "	350 "	7 "	6 "	480	575	655	727	790	853	910	965	1063	1404
2½	2½ "	400 "	7 "	6 "	495	580	650	714	775	830	890	935	1024	1365
3	3 "	675 "	7 "	6 "	495	580	645	705	762	815	872	915	1000	1353
4	4 "	1300 "	8 "	10 "	482	547	609	662	712	756	804	846	921	1240
5	5 "	1900 "	10 "	10 "	440	495	545	590	633	671	708	744	810	1085
6	6 "	2700 "	12 "	12 "	367	410	450	484	520	550	580	607	660	880
8	8 "	4800 "	18 "	12 "	300	333	363	391	415	440	464	485	525	695
10	10 "	7500 "	20 "	12 "	282	313	341	367	390	414	436	456	493	655
12	12 "	10500 "	24 "	14 "	210	232	252	272	290	306	321	335	362	480
15	15 "	16500 "	30 "	16 "	172	193	208	225	238	252	264	277	300	395
22	22 "	35000 "	48 "	16 "	122	133	143	153	162	171	179	188	200	265

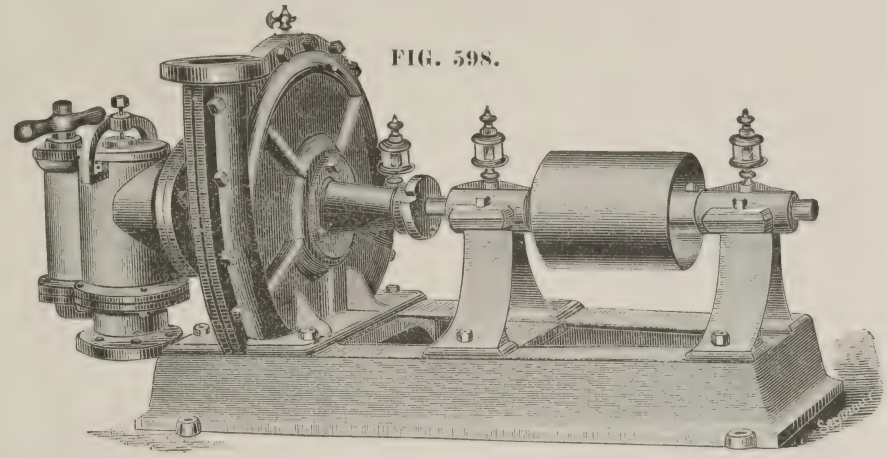
N. B.—Speed is an important factor in the capacity of a Centrifugal Pump, and it should be observed that a slight diminution of speed will result in a considerable reduction of the amount of water raised to the specified height.

The numbers given to different sizes of Centrifugal Pumps correspond with the diameters of Discharge Pipes in inches.

Horizontal Centrifugal Pump.

WITH PRIMER FOR SUCTION PIPE.

FIG. 598.



The cut on this page represents our **Fig. 598**, a Horizontal Centrifugal Pump, which is extensively used in Paper Mills, Tanneries, and for irrigating. It has the advantage of being more readily examined and taken apart in case of accident, than the Vertical Pump, **Fig. 596**; although there is no essential difference in their construction and operation. A flange is provided on the Pump (where the Primer is attached) for bolting to the side of a Tank, Flume, or Induction Pipe when the Primer is not used, and the water is on a level with the Pump. When the water is below the Pump (not more than twenty-five feet) the Primer may be dispensed with if a Foot Valve is used, in which case the Pump and Suction Pipe must be filled before starting. However, it is better in any case to use both Primer and Foot Valve.

The Primer has but one Valve which can be reached by simply taking out the Cap Screws and removing the Plate. To prime the Pump, open the Pet-cock on top of the Shell, and continue working the Plunger until water flows out of the Pet-cock; close it, and the Pump is ready for action. The Pump may be emptied of water, to prevent freezing, by withdrawing the screws near the bottom of Primer and Pump-case. The large sizes of Horizontal Centrifugal Pumps have a Power Primer.

DIRECTIONS FOR OPERATING:—Bolt the Frame to the foundation; see that the Shaft is horizontal, and works smoothly in its bearings; and arrange Belt to run the Pump in the direction of Scroll and Discharge. If the Pump is set above water, and Primer is not used, a Foot Valve should be placed at end of suction pipe; all joints should be tight, and the Pump and Pipe filled with water. If Primer is used, the joints and stuffing-boxes should be packed tight, the same as though Primer is not used; also, it is best to use the Foot Valve, as mentioned above.

These Pumps can be furnished either *right or left handed;* but, unless otherwise ordered, will always be shipped *right handed*, as shown in cut.

Sizes and Prices.

*No. of Pump and Size Discharge.	WITH SUCTION PRIMER.				WITHOUT SUCTION PRIMER.				Prices of Foot Valves.	
	IRON.		BRASS.		IRON.		BRASS.			
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Iron.	Brass.
1½	Glitter	$ 45.00	Glossy	$ 80.00	Gobble	$ 35.00	Gorilla	$ 65.00	$ 5.00	$ 8.00
1¾	Gloaming	60.00	Gloved	120.00	Godly	50.00	Gosling	100.00	6.00	9.00
2	Gloat	85.00	Glower	150.00	Goggle	70.00	Gospel	125.00	7.00	12.00
2½	Gloated	95.00	Glucose	175.00	Golden	80.00	Gossamer	150.00	8.00	15.00
3	Globular	115.00	Glutted	210.00	Gondola	95.00	Gossip	175.00	9.00	18.00
4	Globule	155.00	Glutton	330.00	Gondolier	130.00	Gothic	275.00	12.00	25.00
5	Gloomy	195.00	Glycerine	420.00	Goodness	165 00	Gouty	350.00	15.00	30.00
6	Glorify	240.00	Goatee	495.00	Goody	200.00	Graceful	410.00	20.00	40.00
8	Glorious	375.00	. . . .	. . . .	Gopher	310.00	. . . .	. . . .	30.00	. . .
10	Glossary	470.00	. . . .	. . . .	Gordian	395.00	. . . .	. . . .	40.00	. . .
12	. . . .	. . . .	. . . .	. . . .	Goring	500.00	. . . .	. . . .	50.00	. . .
15	. . . .	. . . .	. . . .	. . . .	Gorged	710.00	. . . .	. . . .	75.00	. . .
22	. . . .	. . . .	. . . .	. . . .	Gorgeous	1,500.00	. . .	. .	. . .	. . .

* The *number* of the Pump is the same as the diameter (in inches) of the Discharge Opening.
For capacity of Centrifugal Pumps, see table on preceding page.

PORTABLE
Greenhouse Force Pumps.

WITH DISCHARGE HOSE, NOZZLE AND SPRINKLER.

FIG. 660.

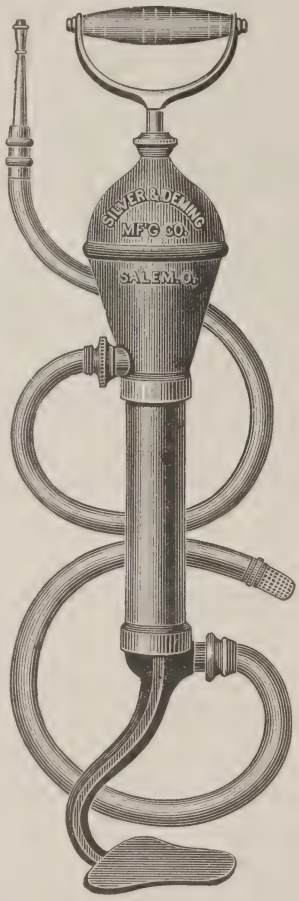
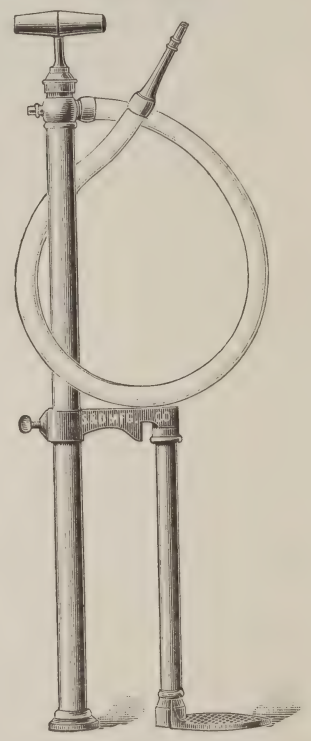


FIG. 662.



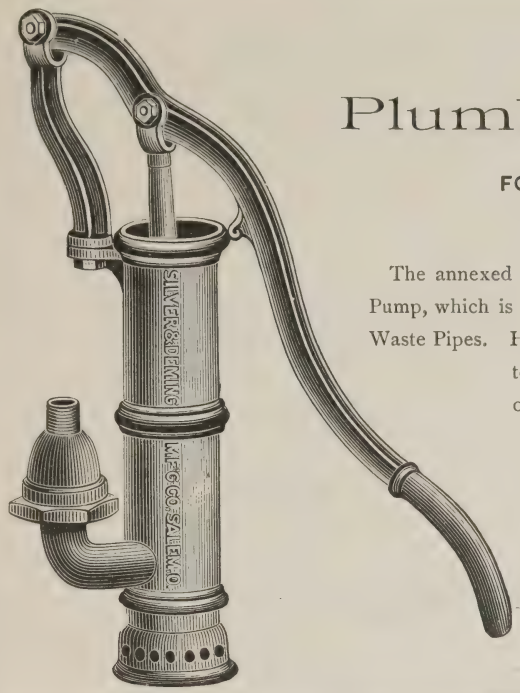
The above cuts represent two different styles of Portable Hand Force Pumps for watering Lawns, Flower and Vegetable Gardens, extinguishing Fires, washing Windows, Carriages, etc., and for spraying Fruit Trees, Tobacco and Cotton with a liquid preparation for destroying insects. These Pumps can also be used to advantage on small Sailing Vessels, and for pumping out wet cellars; also for many other purposes about private and public buildings.

Fig. 660 is used by Plumbers for forcing out pipe, and a Conical Tip is furnished for this purpose at an additional cost as given in list. Both **Figs. 660** and **662** have three feet of half-inch Discharge Hose, with Nozzle and a Spray Attachment. **Fig. 660** has two and one-half feet of three-quarter inch Suction Hose, while **Fig. 662** is arranged with the suction opening on the end of the Cylinder (which is longer than in **Fig. 660**), attached to which is an adjustable Foot-rest. The cuts illustrate both these Pumps as they appear.

Sizes and Prices.

Fig.	Discharge.	Suction.	Without Conical Tip.		* With Conical Tip.	
			Cipher.	Price.	Cipher.	Price.
660	3 feet ½ inch hose, nozzle and spray.	2½ feet ¾ inch hose.	Hatchet	$9.00	Hateful	$10.00
662	3 " ½ " " " " "	In extension of Cyl.	Hatching	9.00	. . . . .	. . . .

* The Conical Tip is used by Plumbers in forcing out waste pipe.



STANDARD

Plumbers' Force Pump.

FOR FORCING OUT WASTE PIPE.

FIG. 560.

The annexed cut represents **Fig. 560**, our "Standard" Plumbers' Force Pump, which is extensively used by Plumbers in forcing out obstructions from Waste Pipes. Hose is attached to the discharge and is connected to the Pipe to be operated upon; the Pump being placed in a bucket or other vessel containing water.

Size and Price.

Fig.	Discharge Fitted For	Cipher.	Price.
560	¾ inch hose.	Hatter	$10.00

STANDARD

Gas Fitters' Drip Pump.

FOR EXTRACTING WATER FROM GAS DRIPS.

FIG. 561.

The cut opposite represents **Fig. 561**, our Gas Fitters' Drip Pump, with Brass Cylinder and Stuffing-box. It is a positive Suction Pump, is substantially constructed in every particular, and answers admirably the purpose for which it is intended.

Size and Price.

Fig.	*Suction Fitted For	Cipher.	Price.
561	¾ inch pipe.	Haughty	$12.00

* Fitted for 1 inch pipe, but always for ¾ inch, as listed, unless otherwise ordered.

Air Pressure Pumps.

FIG. 563.—Brass Air Pressure Pump.

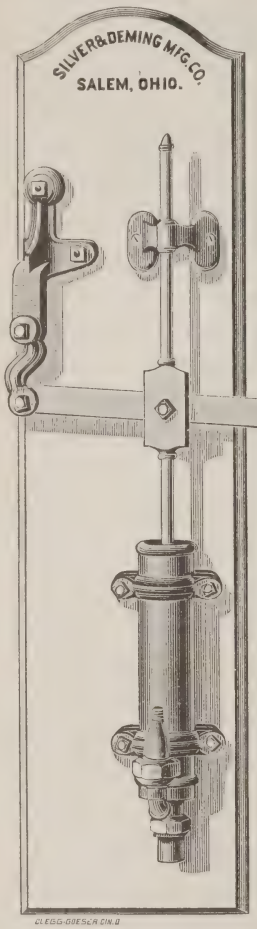
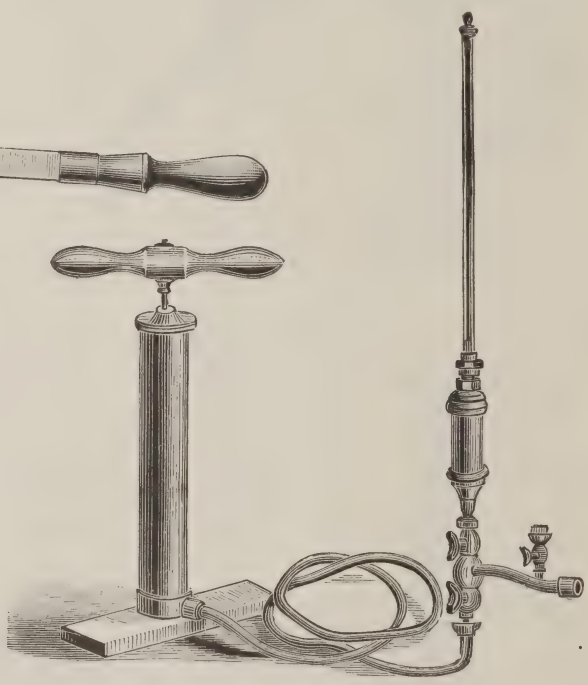


FIG. 564.—Gas Fitters' Proving Pump.



The above cuts represent **Fig. 563,** our Brass Air Pressure, or Vacuum Pump; and **Fig. 564,** Gas Fitters Proving Pump, shown with mercury gauge. These Pumps are made of Brass, with Metallic Valves, and are constructed in the best possible manner. Air Compression Pumps for Power will be found on page 155.

Sizes and Prices.

Size Cylinder.	Fig. 563, Brass Air Pump.			* Fig 564.—Gas Fittefs' Proving Pump, with Hose only.			
	Stroke.	Cipher.	Price.	Stroke.	Hose.	Cipher.	Price.
2 inch.	6 inch.	Humanize	$15.00	10 inch.	3 feet.	Humility	$15.00

* **Fig. 564** with Mercury Gauge, complete, $10.00 extra list; Spring Gauge, complete, $10.00.

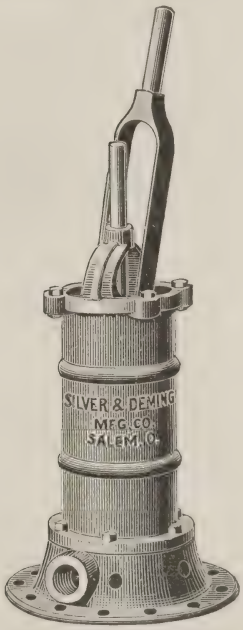
IMPROVED

Compression and Vacuum Pumps.

FOR COMPRESSING, OR EXHAUSTING AIR.

FIG. 657.—With Brake for Hand.

FIG. 658.—With Pitman for Power.



The above cuts represent two different styles of Air Pressure, or Vacuum Pumps, **Figs. 657** and **658**, which differ from each other only in the arrangement for applying the power, **Fig. 657** being arranged with Brake for Wood Levers, and **Fig. 658** having a Pitman for any kind of power. These Pumps are constructed with Brass-lined Cylinder, solid Brass Plunger, and Brass Valves. On the up stroke of the Plunger the air is taken in the Cylinder at the Inlet Valve, and on the down stroke it is forced out at the Outlet Valve. These Pumps will discharge air against a pressure of 100 pounds to the square inch. When used as a Vacuum Pump, the vessel to be exhausted of air is connected with the Inlet Valve, and, as an Air Compressing Pump, the vessel is attached to the Outlet Valve.

Sizes and Prices.

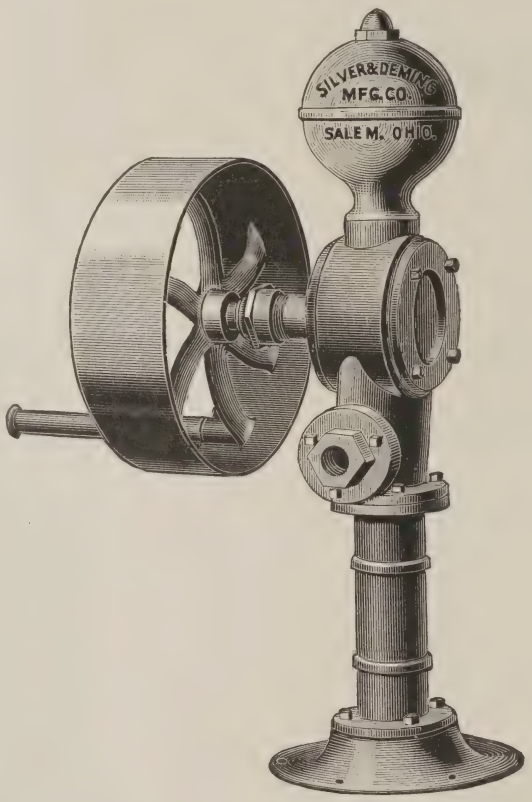
Size Cylinder.	Inlet Valve Opening.	Outlet Valve Opening.	Stroke.	FIG. 657.		FIG. 658.	
				Cipher.	Price.	Cipher.	Price.
6 inch.	1¼ inch.	1¼ inch.	12 inches.	Hackneyed	$50.00	Hustling	$40.00

IMPROVED

Hand and Power Piston Pump.

WITH AIR CHAMBER, CRANK SHAFT, PULLEY AND HANDLE.

FIG. 585.



The above cut represents **Fig. 585**, which has single Pulley, with a Handle attached, so that if desired it may be worked by hand. This Pump is constructed with Cylinder in the stock, the plunger being operate dby a steel Crank Shaft and Pitman, which are inclosed below the Air Chamber. **Fig. 585** is well adapted for use in Cheese Factories and Creameries; it is suitable for raising water from shallow wells, springs and cisterns, by hand or power, and will force it to any point desired. **Fig. 585** is frequently used for filling boilers, tanks, etc. It can be used in deep wells in connection with such Cylinders, or working sections, as **Figs. 304 and 305**, on page 79, and will be fitted for attaching to independent Cylinders when ordered.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction Fitted For	Discharge Fitted For	Stroke.	Pulleys.	Cipher.	Price.
4	3 inch.	1¼ inch pipe.	1¼ inch pipe.	5 inch	15x4	Haddock	$25.00
5	3½ "	1½ " "	1½ " "	5 "	15x4	Haggard	32.00

IMPROVED

Hand and Power Piston Pump.

WITH AIR CHAMBER, CRANK SHAFT, TIGHT AND LOOSE PULLEYS.

FIG. 590.

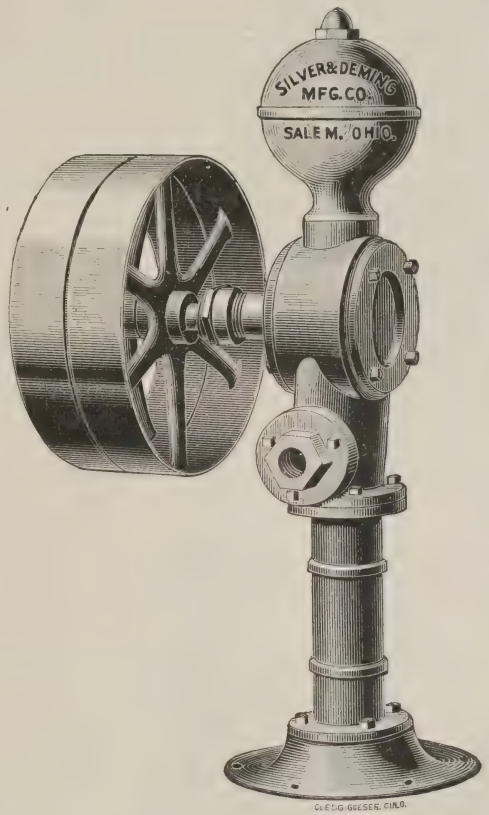


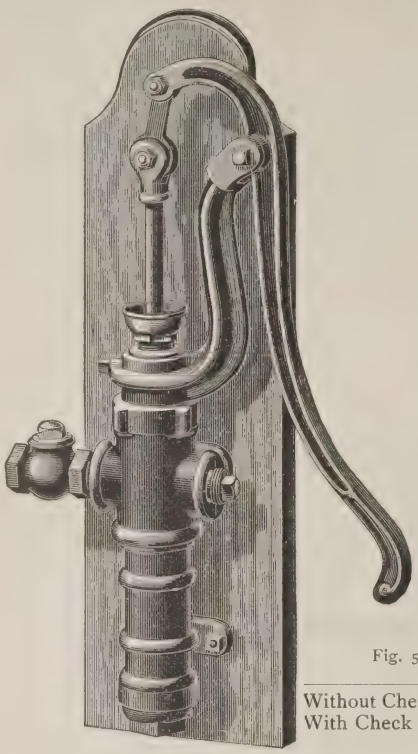
Fig. 590, represented by the above cut, is the same as **Fig. 585,** with Tight and Loose Pulleys, and is adapted for Power only.

It is adapted for shallow wells, or other places where the water supply is not over twenty-five to twenty-eight feet below the Pump. It can be used in deeper wells by omitting the Plunger and Lower Valve, and attaching one of our independent Cylinders or Working Barrels, for instance **Figs. 304 or 305,** shown on page 79. **Fig. 590** will be fitted with stub rod, omitting Plunger and Valves, for deep wells, at same list prices when so ordered. Both **Figs. 590** and **585** are used to advantage in Cheese Factories and Creameries. Cylinders for deep wells are described and listed on pages 77 to 82.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	Size Cyl.	Suction Fitted For	Discharge Fitted For	Stroke.	Pulleys.	Cipher.	Price.
4	3 inch.	1¼ inch pipe.	1¼ inch pipe.	5 inch.	16x3	Haggish	$30.00
5	3½ "	1½ " "	1½ " "	5 "	16x3	Haggling	37.00



IMPROVED
Boiler Feed Pump.

RIGHT OR LEFT HANDED.

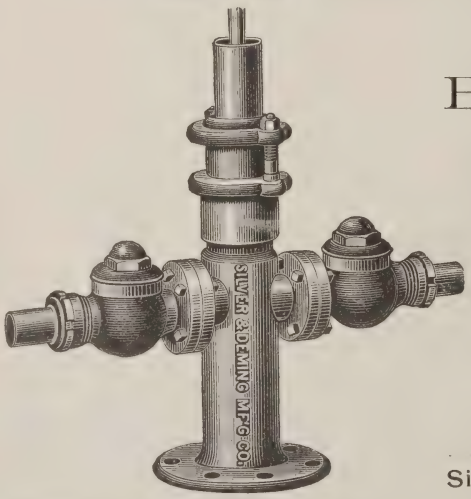
FIG. 587.

The annexed cut represents our Hand Boiler Feed Pump, **Fig. 587.** This Pump is especially made for supplying water to boilers in **Steam Heating** work, and wherever a Hand Pump can be utilized for a low pressure steam boiler.

When required for pumping hot water, we make this Pump with Metallic Fittings, as per list below. In such cases the Pump should be located as near the water as possible.

Sizes and Prices.

Fig. 587.	Size Cyl.	Suc. and Dis. Fitted for	PLAIN VALVES. Cipher.	PLAIN VALVES. Price.	METALLIC VALVES. Cipher.	METALLIC VALVES. Price.
Without Check Valve.	2 inch.	1 inch pipe.	Habitation	$ 8.00	Hackle	$10.00
With Check Valve.	2 "	1 " "	Habitual	10.00	Hackney	12.00



IMPROVED
Boiler Feed Pump.

WITH STUB END FOR POWER.

FIG. 588.

The annexed cut represents **Fig. 588,** our Steam-Boiler Feed Pump, with stub end for power, having an improvement of attaching the Check Valves with Flanges and Bolts, instead of being cast on the Pump, as this style of Pump is usually constructed by other manufacturers. The Check Valves are provided with Coupling Nuts and Brass Tubes for connecting suction and discharge pipe. Furnished with either Iron or Brass Check Valves, as listed below.

Sizes and Prices.

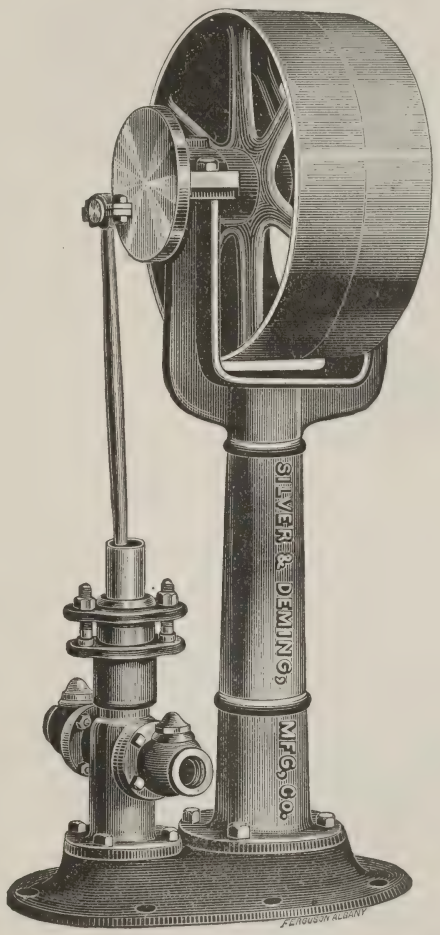
No.	Size Piston.	Suction Fitted for	Discharge Fitted for	Stroke.	WITH IRON CHECK VALVES. Cipher.	WITH IRON CHECK VALVES. Price.	WITH BRASS CHECK VALVES. Cipher.	WITH BRASS CHECK VALVES. Price.
2	1¼ inch.	¾ inch pipe.	¾ inch pipe.	6 inch.	Halberd	$10.00	Hamper	$11.00
3	1½ "	1 " "	1 " "	6 "	Halcyon	16.00	Handful	18 00
4	1½ "	¾ " "	¾ " "	3 "	Halibut	15.00	Handicap	16.00
5	2 "	1 " "	1 " "	3 "	Hallow	18.00	Handily	20.00
6	2½ "	1 " "	1 " "	3 "	Halo	22.00	Handsome	24.00
7	3 "	1¼ " "	1¼ " "	3 "	Halter	27.00	Handy	30.00
8	2 "	1¼ " "	1¼ " "	6 "	Halved	22.00	Hanged	25.00
9	2½ "	1¼ " "	1¼ " "	6 "	Hamlet	30.00	Hanker	33 00
10	3 "	1½ " "	1½ " "	6 "	Hammock	40.00	Happen	45 00

Steam=Boiler Feed Pump.

ON BED PLATE, WITH COLUMN AND TWO PULLEYS.

FOR HAND OR POWER.

FIG. 592.



This cut represents **Fig. 592**, an Improved Boiler Feed Pump, on Bed Plate and Column, with tight and loose Pulleys for Power. There is a substantial wrought-iron Handle on the end of Crank Shaft, opposite the Face-plate, so that the boiler can be filled by hand when necessary. The Crank Shaft has a bearing on each side of the Pulleys. The Plunger, Piston and Valves are Brass. Each Pulley is provided with a set screw for fastening it to the Crank Shaft.

Sizes and Prices.

No.	Size Piston.	Suction Fitted for	Discharge Fitted for	Stroke.	Size Pulleys inches.	Cipher.	Price.
1	2 inch.	1 inch pipe.	1 inch pipe.	3 inch.	16x4	Hardly	$34.00
2	2½ "	1 " "	1 " "	3 "	16x4	Harem	40.00
3	3 "	1¼ " "	1¼ " "	3 "	16x4	Harmless	50.00
4	2 "	1¼ " "	1¼ " "	6 "	18x4	Harmonics	65.00
5	2½ "	1¼ " "	1¼ " "	6 "	18x4	Harmony	75.00
6	3 "	1½ " "	1½ " "	6 "	18x4	Harpist	85.00

Counter Shaft and Face Plate.

WITH PULLEYS. FOR OPERATING PUMPS.

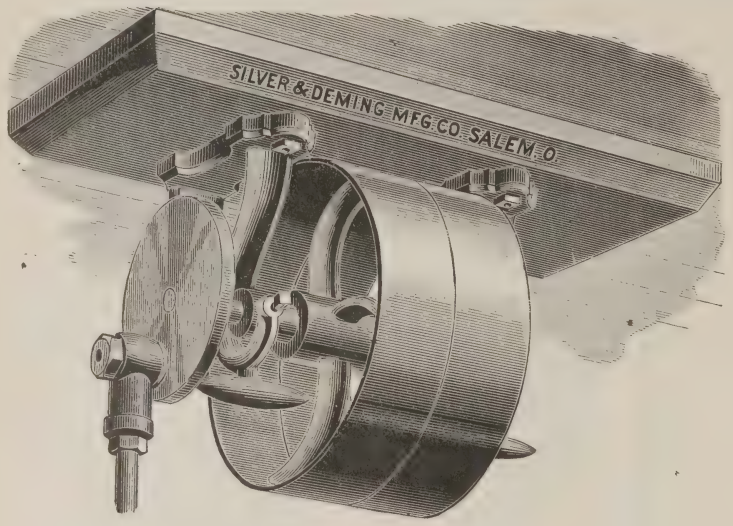


FIG. 698.

Fig. 698 is a Counter-shaft with Tight and Loose Pulleys and Face-plate with stub end for connecting to any of our Force and Lift Piston Pumps. Means can readily be devised for attaching the Stub Rod to the Pitman or Piston-rod of the Pump. See price list at bottom of page.

GEARED

Counter Shaft and Face Plate.

WITH PULLEYS. FOR OPERATING HEAVY PUMPS.

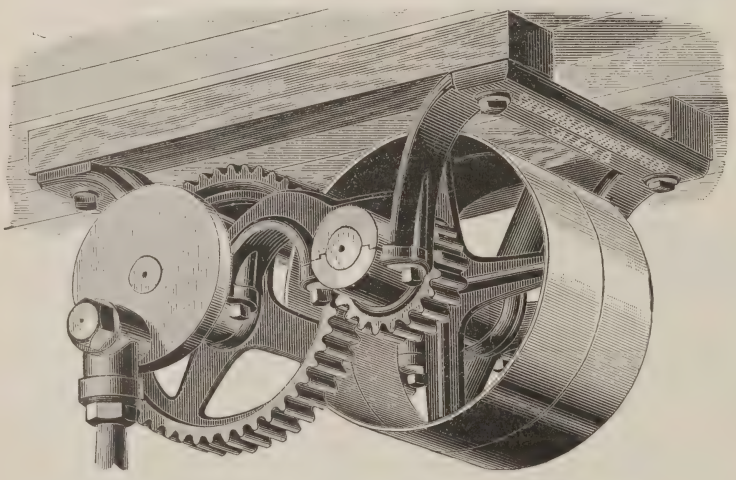


FIG. 699.

The above cut represents **Fig. 699**, a Counter-shaft and Pulleys, with Back Gearing arranged to increase the power three to one. The Face-plate and Stub Rod, as in **Fig. 698**, can be arranged to give different lengths of stroke. The hangers are arranged for bolting to heavy timbers. This is a substantial device for operating our heaviest Pumps and Working Heads.

Rules and Tables for Capacity, Required Power, and Speed of Pumps, pages 9 to 12.

Sizes and Prices.

No.	*Adapted for Pump with Stroke.	FIG. 698.			FIG. 699.		
		Pulleys.	Cipher.	Price.	Pulleys.	Cipher.	Price.
1	6, 8 or 10 inch.	12x3½ inch.	Harshly	$25.00	12x3½ inch.	Hassock	$ 50.00
2	6, 8, 10, 12 or 16 inch.	18x 4 "	Harvest	35.00	18x4 "	Hastily	100.00

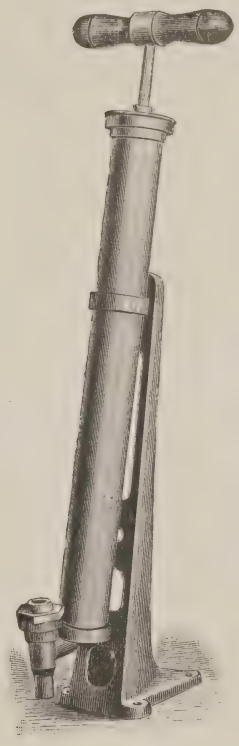
* Arranged for any length of stroke as given above, but always for 6 inch stroke, unless otherwise ordered.

IMPROVED

Brass Air Pressure Pump.

WITH IRON FOOT-REST.

FIG. 562.



The above cut represents our Pneumatic Pump, which is used for compressing air, in raising liquids, such as illuminating oils, beer, ale, etc. The Cylinder of this Pump is made of the best quality of brass tubing. The valves are ground in, so they are perfectly air-tight. We furnish Pumps with or without stop-cock, as listed below.

All parts are made of brass except the Frame, Foot-rest and Piston Rod. The Plunger is of brass and Piston Rod of galvanized rolled steel.

Sizes and Prices.

Fig. 562.	Diameter of Cylinder.	Length of Stroke.	Price without Stop-cock.	Price with Stop-cock.
Air-Pump.	2 inches.	18 inches.	$10.00	$12.00.

"THE KEYSTONE"

Double-Acting Well Force Pumps.

WITH COMMON TOP. FOR SHALLOW AND DEEP WELLS.

FIG. 260.

FIG. 261.

FIGS. 260, 261, 262 and 263.

The cut to the left represents our **Fig. 260** "Keystone" Pump, with common top, for shallow wells, and the cut to the right, **Fig. 261** "Keystone" Pump for deep wells. **Fig. 260** can be changed into **Fig. 261** by simply using two attachments, one for the upper and the other for the lower cylinder. The upper cylinder of the "Keystone" Pump, has a solid plunger and is one-half the capacity of the lower cylinder, thus discharging an equal amount of water at each stroke.

In all the "Keystone" Pumps, there is ample Air Chamber space (the entire stock of the Pump except in **Figs. 263** and **463**), thus insuring the discharge of a continuous stream of water. The upper cylinders of all "Keystone" Pumps are brass lined; and the lower cylinders of **Figs. 260** and **261**, (on this page) and **460** and **461** (on next page,) are also brass lined.

The lower cylinders of **Figs. 262, 263, 462,** and **463** are our **Fig. 322** Brass tube cylinders, 12 inches long. When wanted for smallest diameter of Drilled Wells, **Figs. 262** and **462** should be used, as both upper and lower cylinders are constructed with the least possible outside diameter.

The advantages of the "Keystone" Pumps are: smooth true cylinders, so constructed that the plungers and piston rods are always in line, large water-ways around upper cylinders; large Air Chamber space; adaptability to either shallow or deep wells (this is done by simply using attachments for shallow well pumps to adapt them for deep well); compactness; beauty of design; ease of operation; and simplicity of construction.

The "Keystone" Pumps, all have strainer and hose attachment, and are provided with reversible Lever.

Both **Figs. 263** and **463** are arranged with Vertical three-way distributing Valve, as may be seen by cut of **Fig. 463** on next page.

Sizes and Prices.

No.	Size lower Cylinder.	Fitted for Pipe.	Stroke.	†Fig. 260 for Shallow Wells.	Fig. 261 for Deep Wells.	*Fig. 262 for Deep Drilled Wells.	Fig. 263 with 3-Way Valve.
2	2½ in.	1¼ in.	6 in.	. . .	$15.00	$16.00	$20.00
4	3 "	1¼ "	6 "	$15.00	16.00	17.00	21.00
6	3½ "	1½ "	6 "	17 00	. . .	. . . .	. . . .

†Two attachments for changing **Fig. 260** into Deep Well Pump **Fig. 261**, $1.00; each attachment 50 cents.

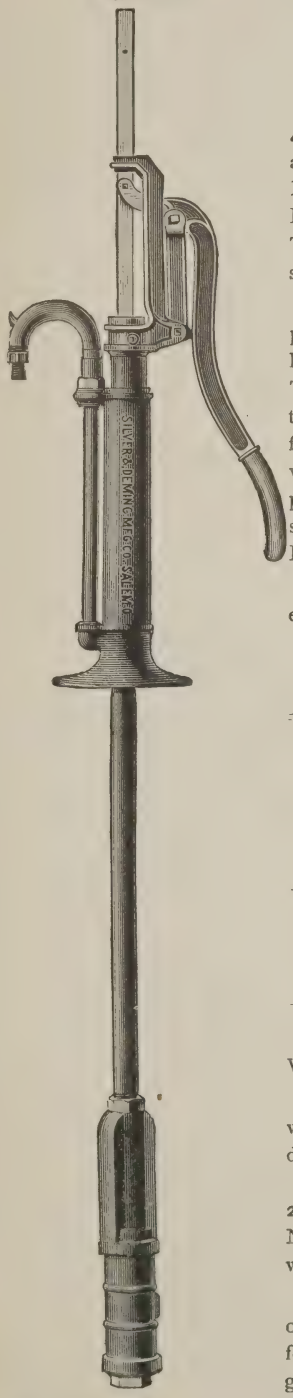
***Fig. 262** has **Fig. 322** Brass Tube lower cylinder. Both Upper and Lower Cylinders of No. 2 will go in 3-inch drilled wells; and No. 4 in 3½-inch drilled wells.

The Lower Cylinder of No. 2 **Fig. 263** will go in 3-inch drilled wells, and No. 4 in 3½-inch drilled wells. The upper cylinder of **Fig. 263** being of larger diameter on account of 3-way valve, will necessitate the digging of a pit about 4 feet deep to accommodate the under-ground discharge pipe.

THE "KEYSTONE"

Double-Acting Well Force Pumps.

FIG. 460.



WITH WIND-MILL TOP. FOR SHALLOW AND DEEP WELLS.

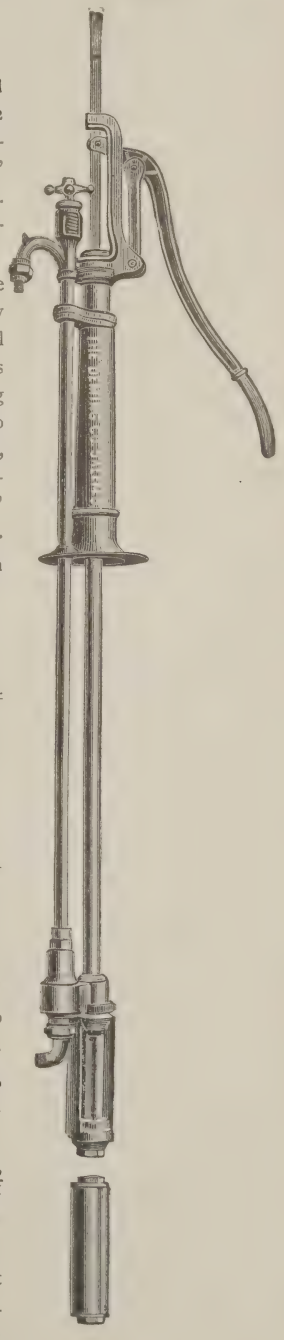
FIGS. 460, 461, 462 and 463.

The "Keystone" Pumps, **Figs. 460, 461, 462 and 463,** are the same in all respects as **Figs. 260, 261, 262 and 263** respectively, except they are made with Wind-Mill Top. The cut to the left shows our "Keystone" Pump (**Fig 460**) with Wind-Mill Top, for shallow wells. The cut to the right represents our **Fig. 463** "Keystone" Pump with 3-Way Valve.

The "Keystone" Pumps with Wind-Mill Top are provided with a lever, so that they can be operated by hand when necessary. These Pumps with Wind-Mill Top, give a direct vertical motion to the rod, which works through a guide above the fulcrum, thus diminishing friction and uneven wearing of the Plungers. For deep wells, we consider the Wind-Mill Top, for hand use, preferable to the Common Top, when durability is considered. The general description of the "Keystone" Pumps on preceding page applies to those on this page.

A Strainer and Hose attachment are furnished with each Pump.

FIG. 463.



Sizes and Prices.

No.	Size Lower Cylinder.	Fitted for Pipe.	Stroke.	†Fig. 460, for Shallow Wells.	Fig. 461, for Deep Wells.	*Fig. 462, for Deep Drilled Wells.	Fig. 463, with 3-Way Valve.
2	2½ in.	1¼ in.	6 in.	. . .	$16.00	$17.00	$21.00
4	3 "	1¼ "	6 "	$16.00	17.00	18.00	22.00
6	3½ "	1½ "	6 "	18.00	. . .	. . .	. . .

†Two attachments for changing **Fig. 460** into Deep Well Pump **Fig. 461, $1.00.** Each attachment 50 cents.

***Fig. 462** has **Fig. 322** Brass Tube lower cylinder, which with the upper cylinder of No. 2, will go in 3-inch drilled wells and No. 4 will go in 3½-inch.

The Lower Cylinder of No. 2, **Fig. 463** (**Fig. 322, 2½ x 12**) will go in a 3-inch drilled well, and that of No. 4 (**Fig. 322, 3 x 12**), will go in 3½-inch drilled wells.

The upper cylinder is of larger diameter on account of 3-Way Valve, therefore a pit should be dug about 4 feet deep for **Fig. 463,** to accommodate the underground discharge pipe.

THE "DEMING"

Improved Spraying Pump.

WITH ADJUSTABLE BASE AND BRASS WORKING PARTS.

FIG. 550.

(Barrel is not furnished with Pump.)

The Pump represented by above cut has all the features required of a portable spraying Pump. It has adjustable barrel attachment or base to fit the top or side of a barrel, the suction pipe being long enough to almost reach the bottom of barrel in either case. The barrel is *not* furnished with the Pump, but is shown to give a correct idea of the manner of operating the outfit. The Pump and barrel can be placed on a wagon or other convenient vehicle and moved about at pleasure. The air chamber is large enough to insure a constant stream, and cause the Pump to work easily. The Pump swings on its base, or barrel attachment, where it may be fastened in any position. The working parts are made of brass; the Cylinder being brass-lined, the Piston Rod brass-cased, and the Plunger and Valves solid brass.

Fig. 550 is lighter and more symmetrical than **Fig. 554** which it supersedes, having the same list prices and same attachments (corresponding to outfits A and B) with the addition of one foot more of hose.

The cylinder of this Pump is 2¼ inches in diameter, and stroke 5 inches in length.

Sizes and Prices.

Fig. 550	Spray Pump only, with 1½ feet of 1-inch suction pipe and ¾-inch discharge hose coupling	$9.00
Outfit "A."	**Fig. 550** Spray Pump, with 1½ feet of 1-inch suction pipe, and 4 feet of ¾-inch hose, without nozzle	$10.00
Outfit "B."	**Fig. 550** Spray Pump, with 1½ feet of 1-inch suction pipe, and 4 feet of ¾-inch hose, with nozzle and sprinkler (spray tip), as shown in the cut	$11.00
Outfit "C."	**Fig. 550** Spray Pump, with 1½ feet of 1-inch suction pipe, and 4 feet of ¾-inch discharge hose, nozzle and sprinkler; 4 feet of ½-inch "agitator" hose with nozzle, for returning to barrel to keep liquid well mixed. A stop cock is provided to shut off the agitator discharge, or to regulate it when desired. Both discharges may also be used for spraying; a sprinkler (spray tip) being furnished with the ½-inch nozzle . . .	$15.00

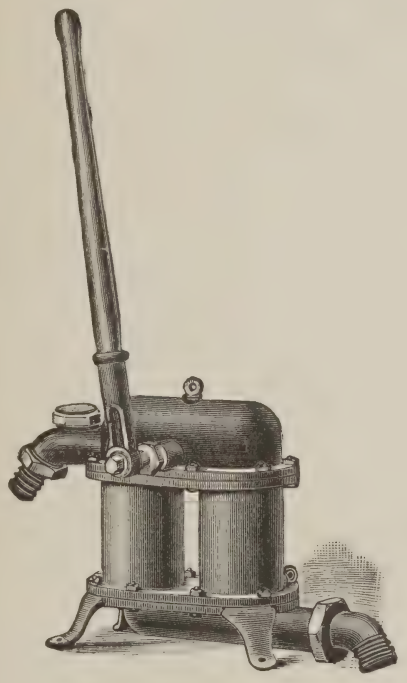
Recipes and directions for using spraying preparations furnished on application.

THE "TORRENT"

Two-Cylinder Thresher Tank Pump.

WITH HOSE COUPLINGS. TIGHT CAP ON UPWARD DISCHARGE.

FIG. 553.



The annexed cut illustrates a valuable new Pump especially adapted for the use of threshermen in filling their Wagon Tanks quickly with water for the purpose of supplying the Steam Engine Boiler.

There has long since been a demand for a **special** Pump of this kind, for the purpose of pumping large quantities of water, with the least possible time and labor.

We are certain that in our **Fig. 553** we have produced a Pump that will satisfy this demand. Wherever used they have given entire satisfaction. This Pump may also be used as a Bilge and Deck Pump on small Vessels, or in any place where it is desired to remove water from, such as cellars, ditches, etc. It is durable and simple in construction and is one of the easiest working Pumps ever made.

The "Torrent" may be used for cleaning out the boiler flues; also as a Fire-pump it will do good service. It is provided with an air chamber, which causes the discharge of a continuous stream of water. On a Thresher-wagon Tank it may be placed in any position that will allow the suction hose to reach the water.

No extension is necessary to the top of Tank, since the suction coupling projects beyond the base of the Pump.

We furnish **Fig. 553** complete with suction and discharge hose couplings; also with suction strainer in connection with various lengths of Hose, etc. as listed below. It may be used to discharge upward through 2-inch pipe by screwing the tight cap on end of spout in place of hose coupling.

Sizes and Prices.

Fig. 553	Size Cylinders	Suction.	Discharge.	Stroke.	Capacity per Stroke.	Price.
Pump only	4½-inch.	for 2-in. Hose.	2-in. opening for 1-in. Hose.	4-inch.	.55 gallon.	$18.00
Outfit "A"	Pump complete with 15 feet of 2-inch spiral-wire suction hose and strainer; 12½ feet of 1-inch 3-ply discharge hose and nozzle					$40.00
Outfit "B"	Pump complete with 20 feet of 2-inch spiral-wire suction hose and strainer; 12½ feet of 1-inch 3-ply discharge hose and nozzle					$45.00
Outfit "C"	Pump complete with 25 feet of 2-inch spiral-wire suction hose and strainer; 12½ feet of 1-inch 3-ply discharge hose and nozzle					$50.00
Outfit "D"	Pump complete with 25 feet of 2-inch spiral-wire suction hose and strainer; 25 feet of 1-inch 3-ply discharge hose and nozzle					$54.00

The "Marine" Bilge Pump.

WITH REVERSIBLE LEVER.

FIG. 470.

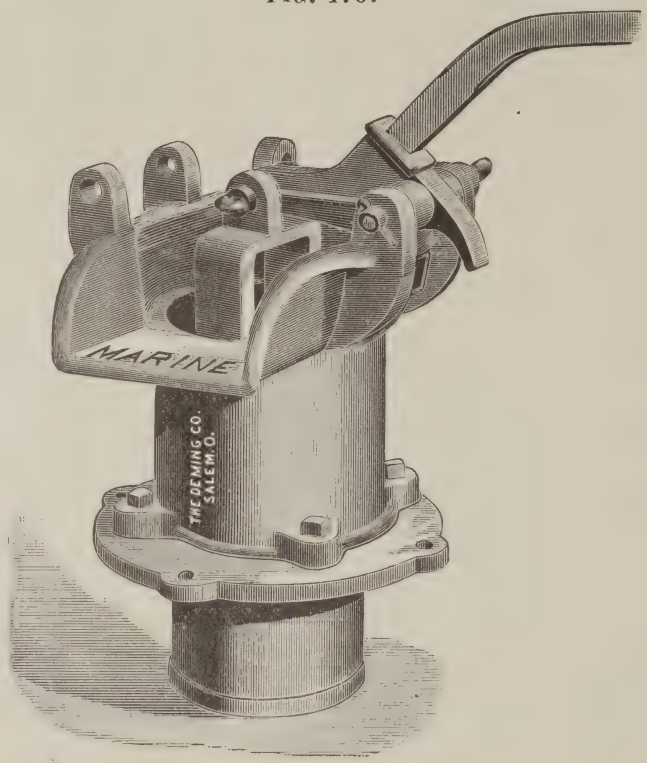


Fig. 470, represented by the annexed cut, is adapted for raising large quantities of water by hand from the bilge well of vessels, from stone quarries and coal mines, cellars and ditches, and for irrigating purposes, where the water is not over 20 feet, vertically, from the Pump. It is much used by contractors in removing water from excavations of various kinds.

There are three fulcrums, as shown by the lugs on the engraving, whereby the Pump may be operated with the lever in any one of three positions. The lever, which is substantially constructed of wrought iron, is bent, so that its position may be reversed in the socket and thus it becomes a vertical lever, which in some instances will be found quite convenient.

The Valves are rubber faced and are made large so as to give ample water way. They are easily removed for repairing. The Cylinder is brass lined. A flange threaded for suction pipe, is bolted to the base of the Pump.

Sizes and Prices.

No.	Diameter of Cylinder.	†Suction Flange for.	Length of Stroke.	Capacity per Stroke.	Price.
2	6 inches	3-inch pipe	4 inches	.49 gallons	$23.00
4	8½ "	4 " "	6 "	1.47 "	30.00

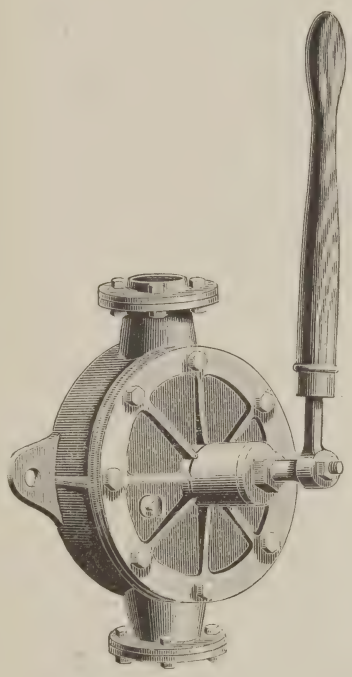
†The suction flange may be fitted for other sizes of pipe, but is always fitted as listed unless otherwise ordered.

THE "IDEAL"

Double-Action Oscillating Force Pump.

WITH BRASS WING PISTON, BRASS VALVES AND VALVE BOX.

FIG. 570.



The "Ideal" Double-Acting Force Pump, represented by the annexed cut, and designated as **Fig. 570, is simple, substantial, durable** and **powerful;** its construction being such as to cause a minimum of friction, thus making it very effective as a Hand Force Pump.

The Pump is operated by means of a lever, which may be worked from either a vertical or horizontal position. A brass double-wing oscillating Piston, with a brass valve on each side or wing, fits snugly in the Cylinder. The shaft or Piston Rod passes through the hub in centre of Cylinder Cap, and is provided with a suitable stuffing-box. The water-way of each set of valves is separated from the other by means of the Suction Valve Box.

These Wing-Valve Pumps, having no leather packing, are well suited to pumping hot liquids, oils, wine, cider, etc. The Suction and Discharge Flanges are fitted for the same size of pipe. We take the greatest pains in the construction of these Pumps, all parts being made to exact templets and gauges, so that repairs will always fit. However, considering the simplicity of construction, repairing is seldom necessary. We make nine different sizes of these Pumps, both of iron (with Brass Wing Piston, Valves and Valve Box), and entirely of brass.

Sizes and Prices.

No.	Suction Flange Fitted for Pipe.	Discharge Flange Fitted for Pipe.	Outside Diameter of Cylinder.	Inside Diameter of Cylinder.	Approximate Capacity per Minute.	PRICES.	
						Iron.	Brass.
0	½ inch.	½ inch.	5¼ inch.	4⅛ inch.	4 Gallons.	$ 5 00	$ 7.00
1	¾ "	¾ "	6½ "	4¾ "	5 "	6.00	9.00
2	1 "	1 "	7¾ "	5⅝ "	6 "	7.25	12.50
3	1¼ "	1¼ "	9 "	6⅜ "	9 "	9.00	15.00
4	1¼ "	1¼ "	10¼ "	7¼ "	13 "	10.00	18.75
5	1½ "	1½ "	11½ "	8⅜ "	19 "	12.00	21.25
6	1½ "	1½ "	12½ "	9⅜ "	22 "	14.50	30.00
7	2 "	2 "	13½ "	10⅝ "	26 "	17.50	40.00
8	2 "	2 "	14½ "	11¾ "	29 "	21.25	50.00

THE "TRIUMPH"

Horizontal Double-Acting Force Pump.

ON HEAVY FRAME FOR POWER. WITH GEARING AND PULLEYS.

FIG. 609.

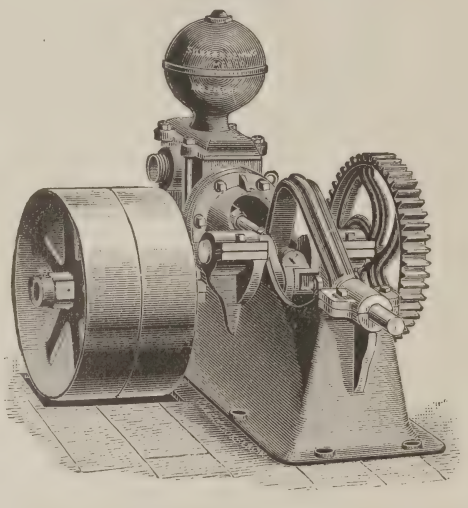


Fig. 609, as illustrated by above cut, shows our Geared "Triumph" Pump, which is calculated to work under heavy pressure. It is substantially constructed in all its parts. The Pump is bolted to a heavy frame, and the Crank Shaft, Rod Guide, Yoke and Pitman, are so arranged as to keep the Piston always in line with the Cylinder.

In pumping against a pressure up to 100 pounds to the square inch, this Pump should be run at the rate of 30 to 50 revolutions per minute. The Pump is geared to increase power three to one; this would make the speed of Pulleys about 90 to 150 revolutions per minute.

When this Pump is to be used for feeding Steam Boilers, it should be so specified in the order, since for this purpose the Piston should be made of hard brass or bronze. The Piston Rod is always made of bronze.

The Valves and Valve Seats are always made of brass, and the Cylinders are brass-lined.

Sizes and Prices.

No.	Size Cylinder.	Suction Fitted for.	Discharge Fitted for.	Stroke.	Size of Pulleys.	Capacity per Stroke.	Iron.	Brass.
1	2½ inch.	1¼ inch.	1¼ inch.	4½ inch.	16 x 4 in.	.20 gallon.	$75.00	$125.00
2	3 "	1½ "	1¼ "	4½ "	16 x 4 "	.30 "	80.00	130.00
3	4 "	2 "	1½ "	4½ "	16 x 4 "	.50 "	85.00	145.00
4	5 "	2½ "	2 "	4½ "	16 x 4 "	.87 "	115.00	185.00

THE "COLUMBIA"
Double-Acting Force Pumps.

FIGS. 490 and 491.

FOR FACTORY, WAREHOUSE AND RAILROAD USE.

FIG. 490.

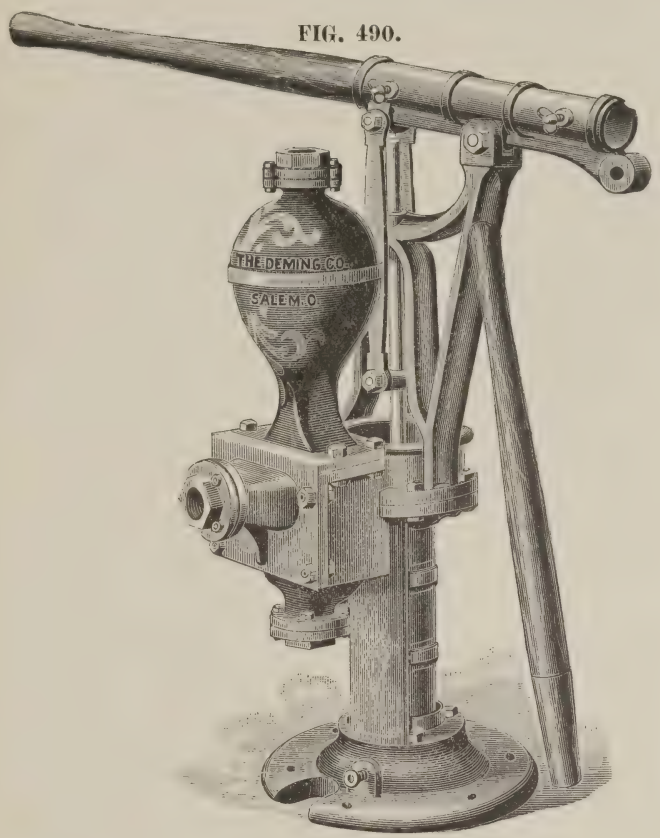
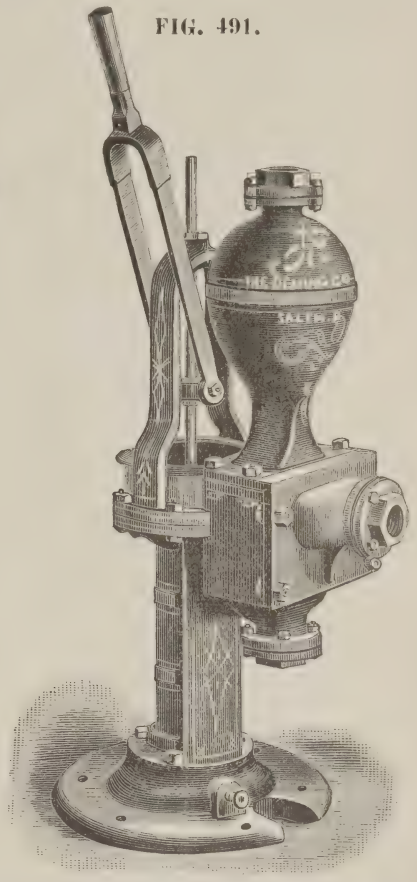


FIG. 491.



The **Figs. 490** and **491** illustrate our "Columbia" Double-acting Suction and Force Pumps, for the use of mills, factories, distilleries, warehouses, railroads, etc. These Pumps are made heavy and strong and are of great durability. The Piston and Rod, Valves and Valve Seats, are made of bronze, the Valves being Rubber faced.

Should repairing become necessary, the Valves may be removed by detaching the face-plate of the Valve box.

Fig. 490 represented by cut on the left, is made to be worked by Wood-levers, but can be used for power by substituting a forked rod attachment. See extra price list below.

Fig. 491 shown by cut on the right, is in all respects the same as **Fig. 490**, save that it is built in larger sizes, and arranged with stub end to Piston rod, to weld connecting rod to, for operating by power of any kind.

Sizes and Prices.

Diameter Cylinder.	Stroke.	*Suction and Discharge.	Capacity per Stroke.	†Fig. 490.		†Fig. 491.	
				Iron.	Brass Lined Cyl.	Iron.	Brass Lined Cyl.
3 inches.	8 inches.	1½ inches.	.49 gallons	$65.00	$72.00	$65.00	$72.00
4 "	8 "	2 "	.87 "	75.00	82.00	75 00	82.00
5 "	8 "	2½ "	1.36 "	90.00	97.50	90.00	97 50
6 "	8 "	3 "	1.96 "	120.00	130.00	120.00	130.00
3 "	12 "	1½ "	.74 "	. . . . .	. . . . .	78.00	90.00
4 "	12 "	2 "	1.31 "	. . . . .	. . . . .	101.00	115.00
5 "	12 "	2½ "	2.04 "	. . . . .	. . . . .	120.00	135.00
6 "	12 "	3 "	2.94 "	. . . . .	. . . . .	160.00	175.00

*Fitted for other sizes of suction and discharge Pipe when ordered.

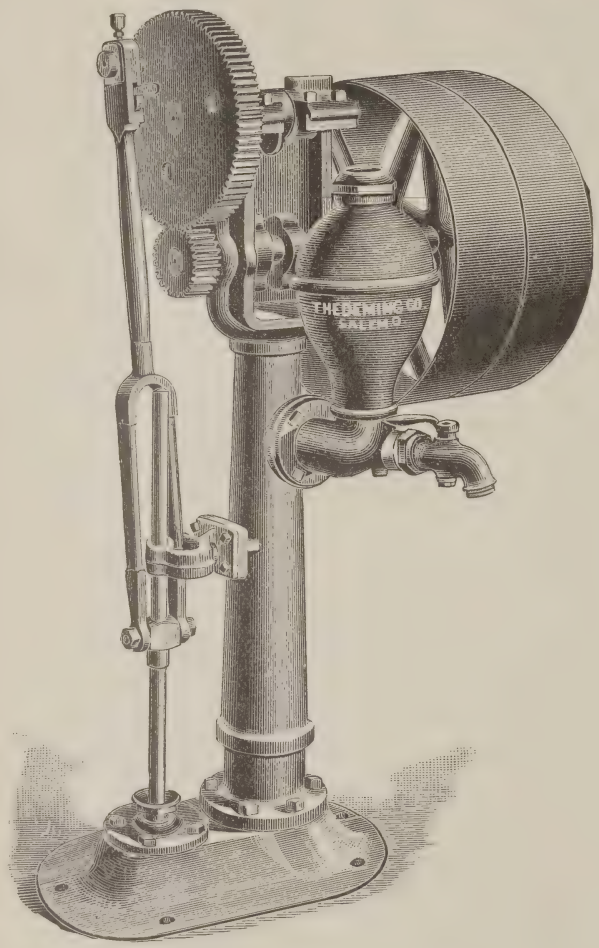
†Forked rod for attaching to Wind-mill for either **Fig. 490** or **Fig. 491**, $2.50 extra list.

Deep Well Force Pump Standard.

WITH GEARING,

ADJUSTABLE STROKE, AND TIGHT AND LOOSE PULLEYS.

FIG. 569.



The annexed cut represents **Fig. 569**, our new Geared Deep Well Force Pump Standard, similar to **Fig. 586**, but arranged with adjustable stroke (6, 8 and 10-inch) and tight and loose Pulleys for operating by belt. As in **Fig. 586**, the Gearing is arranged to increase power, three to one. Any of our Independent Cylinders of suitable length may be used in connection with this Standard.

Fig. 569, Standard, with **Fig. 324, Artesian** Well Brass Cylinder makes a very durable Pumping outfit for Deep Wells. Other Cylinders or Working Barrels adapted for use in connection with **Fig. 569** Standard, are **Figs. 304, 305, 312 and 322.** Every part of this Pump Standard is constructed with a view to great durability.

When **Fig. 569**, which has adjustable stroke, is preferred with Pulley Fly Wheel (like in **Fig. 586**) it is furnished that way at prices in list below.

The speed at which this pump should be run varies with the depth of well. In a shallow well it may of course be run faster than in a deeper well. At 100 feet deep it should be run about 50 revolutions per minute.

Sizes and Prices.

No.	*Suction Fitted for.	Stroke.	Size of Pulleys.	Discharge.	With Pulleys.	With Fly Wheel.
1	1½ in. Pipe.	6, 8 and 10 in.	20 x 5 in.	With Flange for 1¼ inch Pipe.	$78.00	$75.00
2	1½ " "	6, 8 and 10 in.	20 x 5 in.	With Double Discharge Air Chamber.	$81.00	78.00
3	1½ " "	6, 8 and 10 in.	20 x 5 in.	With Air Chamber and Cock.	$83.00	80.00

*Fitted for 1¼, 1½, 2, 2½ or 3-inch Suction; and 1¼, 1½, 2 or 2½-inch Discharge Pipe, but always fitted for 1½ inch Suction and 1¼ inch Discharge, unless otherwise ordered.

N. B. The above cut of **Fig. 569**, represents the No. 3 Pump with Air Chamber and Cock.

IMPROVED

Artesian Well Brass Cylinders.

WITH BRONZE BALL VALVES.

FIG. 324.

We have recently made several improvements in the construction of our Fig. 324 Artesian Well Brass Cylinders, and have discontinued the manufacture of Fig. 314 (with water grooved plunger) as illustrated and described on page 83, of our 1889 catalogue.

Our improved Fig. 324 Cylinder or Working Barrel, represented by the annexed cut, is made entirely of brass; the shell being of heavy brass tubing with hard brass or bronze ball valves, the plunger having cupped leather packings.

The Cylinder is enough smaller in diameter than the conducting pipe or casing, to admit of withdrawing together, the Plunger and Lower Valve when repairs become necessary; thus saving the trouble and expense of taking out the entire Cylinder and pipe.

These Working Barrels may be used in connection with our Figs. 435, 436, and 569 Power Working Heads, and Fig. 438 Steam Pump Head. To give the best results, the Cylinder should be placed in the well at a point where it will always be submerged. A Suction Strainer made of pipe, drilled with enough holes to give ample water-way, may be connected to the bottom attachment.

Fig. 324 may be placed in open wells, and in drilled wells, where the pipe or casing is large enough to admit the Cylinder attachments. The table of "sizes and prices" below, contains the extreme outside diameter of all sizes of Fig. 324 Cylinder attachments, showing what diameter of drilled wells they may be placed in. Fig. 324 Cylinders or Working Barrels are adapted to the deepest wells, and in many cases are successfully operated in wells over 1,000 feet in depth.

In ordering Fig. 324 Cylinders always give the **inside diameter** and **length of stroke.** Unless especially ordered for casing, the top and bottom attachments will always be fitted for pipe as listed in table below; and as explained above, the top attachment is *always* fitted for pipe or casing of larger inside diameter than that of the Cylinder. The cut below represents Fig. 324 as we now make it.

SIZES AND PRICES.

Inside Diameter of Cylinder.	Length of Stroke.	Inside Diam. Pipe or Casing for Top Att.	Inside Diam. Pipe or Casing for Bottom Att.	Extreme Length of Cylinder with Attachm'ts.	Extreme Outside Diam. of Attachm'ts.	‖Strokes per Minute at 150 ft. deep.	Capacity in Gallons per Stroke.	Price Complete.
1⅜ inch.	16 inch.	1½ inch.	1½ inch.	32½ inches.	2¾ inches.	75	.10	$ 15.00
1¾ "	16 "	2 "	2 "	32½ "	3¼ "	75	.17	18.00
2¼ "	16 "	2½ "	2 "	35 "	3½ "	70	.27	24.00
2¾ "	16 "	3 "	2 "	42 "	4 "	70	.41	32.00
3¼ "	16 "	3½ "	2½ "	43 "	4⅝ "	60	.57	50.00
3¾ "	16 "	4 "	3 "	45 "	5¼ "	60	.77	60.00
2¾ "	24 "	3 "	2 "	50 "	4 "	55	.61	38.00
3¼ "	24 "	3½ "	2½ "	51 "	4⅝ "	55	.86	55.00
3¾ "	24 "	4 "	3 "	53 "	5¼ "	55	1.15	65.00
4¼ "	24 "	4½ "	3 "	54¼ "	5⅞ "	50	1.47	75.00
4¾ "	24 "	5 "	3 "	56¼ "	6⅜ "	50	1.84	86.00
*5¼ "	24 "	*6 "	3½ "	57¼ "	6⅞ "	50	2.25	120.00
5¾ "	24 "	6 "	3½ "	57¼ "	7½ "	45	2.70	140.00
†6¼ "	24 "	†7 "	4 "	60¼ "	8⅛ "	45	3.19	180.00
6¾ "	24 "	7 "	4 "	61¼ "	8¾ "	45	3.72	225.00
2¾ "	30 "	3 "	2 "	56 "	4 "	45	.77	45.00
3¼ "	30 "	3½ "	2½ "	57 "	4⅝ "	45	1.08	60.00
3¾ "	30 "	4 "	3 "	59 "	5¼ "	45	1.43	70.00
4¼ "	30 "	4½ "	3 "	60¼ "	5⅞ "	40	1.84	85.00
4¾ "	30 "	5 "	3 "	62¼ "	6⅜ "	40	2.30	100.00
*5¼ "	30 "	*6 "	3½ "	63¼ "	6⅞ "	40	2.81	140.00
5¾ "	30 "	6 "	3½ "	63¼ "	7½ "	35	3.38	160.00
†6¼ "	30 "	†7 "	4 "	66¼ "	8⅛ "	35	3.99	200.00
6¾ "	30 "	7 "	4 "	67¼ "	8¾ "	35	4.65	250.00
3¼ "	36 "	3½ "	2½ "	63 "	4⅝ "	35	1.29	70 00
3¾ "	36 "	4 "	3 "	65 "	5¼ "	35	1.72	90.00
4¼ "	36 "	4½ "	3 "	66¼ "	5⅞ "	30	2.21	100.00
4¾ "	36 "	5 "	3 "	68¼ "	6⅜ "	30	2.76	125.00
*5¼ "	36 "	*6 "	3½ "	69¼ "	6⅞ "	30	3.37	160 00
5¾ "	36 "	6 "	3½ "	69¼ "	7½ "	30	4.06	180.00
†6¼ "	36 "	†7 "	4 "	72¼ "	8⅛ "	25	4.78	220 00
6¾ "	36 "	7 "	4 "	73¼ "	8¾ "	25	5.58	275.00
3¾ "	42 "	4 "	3 "	71 "	5¼ "	30	2.00	100.00
4¼ "	42 "	4½ "	3 "	72¼ "	5⅞ "	30	2.58	125 00
4¾ "	42 "	5 "	3 "	74¼ "	6⅜ "	25	3.22	150.00
*5¼ "	42 "	*6 "	3½ "	75¼ "	6⅞ "	25	3.93	180.00
5¾ "	42 "	6 "	3½ "	75¼ "	7½ "	25	4.74	205.00
†6¼ "	42 "	†7 "	4 "	78¼ "	8⅛ "	20	5.58	245.00
6¾ "	42 "	7 "	4 "	79¼ "	8¾ "	20	6.51	300 00

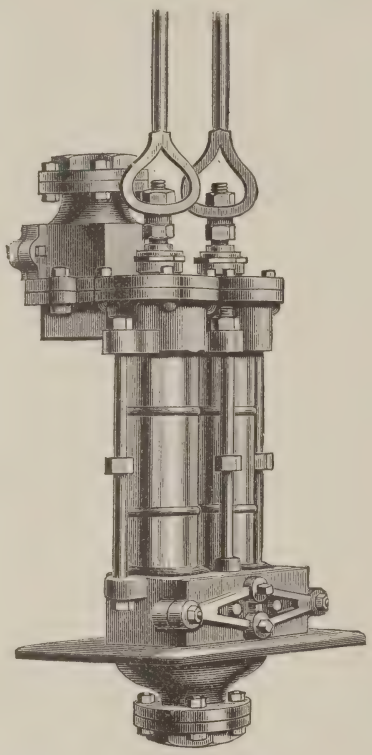
* 5¼-inch Cylinders when ordered for casing, are fitted for 5⅝-inch at top.
† 6¼-inch Cylinders when ordered for casing, are fitted for 6⅝-inch at top.
‖ At less depth than 150 feet speed may be increased, at greater depth decreased, according to conditions.

SPECIAL

Double-Cylinder Deep Well Pump.

WITH DETACHABLE VALVE-BOX CAP.

FIG. 348.



We represent, by the above cut, a two-cylinder Pump, for Deep Wells, which we are making with both Iron and Brass Cylinders. For power adapted to operating the Pump, a Working Head may be made with Double Crank on a shaft. It may also be operated by a Horse-power with Double Crank-shaft over the well. We have made no Working Head especially adapted for operating these Working Barrels, since conditions under which they are used are variable. The nearer the Working Barrels are placed to the water, the better; and in no case should the base be over 20 feet above the water. As will be seen from the cut this Double Cylinder Pump has a flanged base, with single suction and discharge. The lower valves may be removed by detaching the valve box cap. The plungers may be removed by taking off the top attachments or stuffing-box cap.

Sizes and Prices.

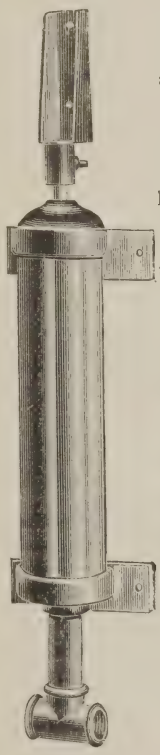
No.	Diameter of Cylinder.	Suction and Discharge.	Stroke.	Capacity per Revolution.	Iron.	Brass.
1	2½ inches.	1½ inches.	10 inches.	.43	$ 50.00	$ 63.00
2	3 "	2 "	10 "	.61	56.00	73.00
3	3½ "	2½ "	10 "	.83	66.00	85.00
4	4 "	2½ "	10 "	1.09	72.00	95.00
5	5 "	3 "	10 "	1.70	105.00	161.00
6	6 "	3½ "	10 "	2.45	146.00	219.00

IMPROVED

Wind-Mill Regulating Cylinder.

FOR REGULATING WATER SUPPLY
IN WIND-MILL TANK.

FIG. 365.



The annexed cut illustrates a Cylinder for regulating the supply of water in Wind-Mill Tanks and for throwing Wind-Mill out of gear when the Tank is full.

The shell of the Cylinder is made of brass tubing, the same as used in our brass cylinders, **Figs. 312** and **322**. The top and bottom attachments or caps, are made of cast iron and are each provided with brackets for fastening to upright timbers.

To the bottom cap is connected a "Tee," to which is attached the discharge pipe, from Pump to the Tank. Where the pipe discharges into the tank is a float valve (**Figs. 350** or **351**) to shut off the flow of water when the tank is full. When this occurs, the pump keeps on operating, until the Regulating Cylinder (which has a solid plunger) is full of water, and as it fills, the plunger and piston, are forced upward.

At the top of piston rod is a coupling for a wood rod which actuates a lever, at one end of which is attached the rope, chain or wire, for automatically pulling the Wind-Mill out of gear. A weight sufficient to pull the mill in gear again (when the water recedes from tank) should be fastened to the end of lever which actuates the piston rod. The automatic operation of the mill is thus maintained and the Tank is kept full.

Sizes and Prices.

No.	Diameter.	Length.	Stroke.	Price.
1	2½ inches.	16 inches.	14 inches.	$11.00
2	3 "	14 "	12 "	12.00

Improved Hand Force Pumps.

FOR DOMESTIC USE, SPRAYING, ETC.

FIG. 514.

PLAIN SPOUT.

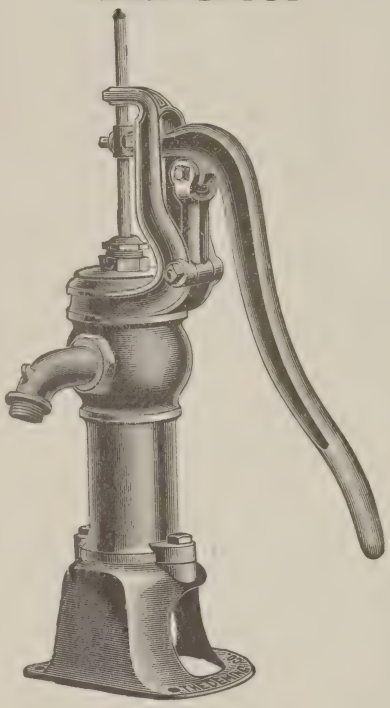
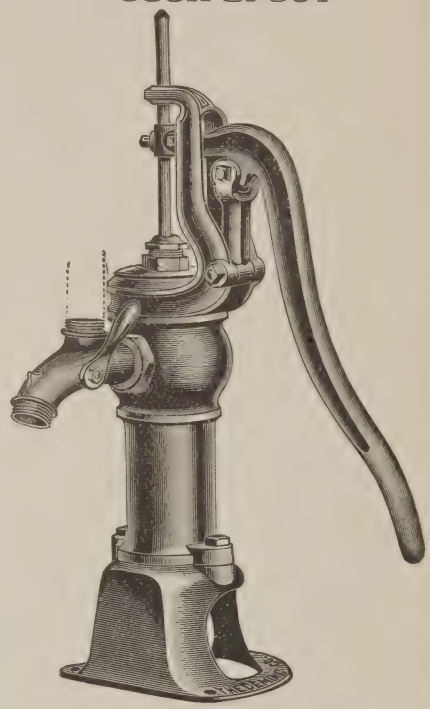


FIG. 515.

COCK SPOUT.



The Pumps illustrated by the above cuts are adapted for a great variety of purposes; such as pumping from shallow wells and cisterns, and for spraying fruit trees, etc. The Cock spout of Fig. 515 is provided with an upward discharge as shown in the cut. When used for forcing water into a house tank, the cock handle should be turned so as to close the spout discharge. By moving the handle to shut off the upward discharge the water will flow through the spout, and vice versa. **Fig. 515** may be used as a double discharge Spray Pump by attaching hose to both the spout and upward discharge, and turning the cock handle to allow water to flow through both discharges; and one of them may be used for agitating the liquid by returning hose to the barrel. The upward discharge is fitted for 1-inch pipe coupling, but when ordered, we furnish a coupling for ¾-inch hose when to be used as above. **Fig. 514** is adapted only for discharging through the spout, but has, like Fig. 515, a ¾-inch hose coupling.

These Pumps have the suction, like Pitcher Spout Pumps, fitted for both iron and lead pipe. The movable link fulcrum with rod guide, gives a direct and smooth vertical motion to the piston rod and avoids an uneven wearing of the plunger and stuffing-box. The base of this Pump is "cut off" like that of a Pitcher Spout Pump. The top may be revolved so as to use the Pump right or left handed.

Sizes and Prices.

No.	Size Cylinder.	Suction for	*Discharge for	Stroke.	Fig. 514.	†Fig. 515.
1	2½ inches.	1 inch Pipe.	¾ inch Hose.	4 inches.	$6.00	$8.50
2	3 "	1¼ " "	¾ " "	4 "	7.00	9.50

*The upward discharge of Fig. 515 (both Nos. 1 and 2) is fitted for 1 inch pipe, but when used as a Spray Pump it may be fitted with ¾ Hose Coupling same as the spout, as described above.

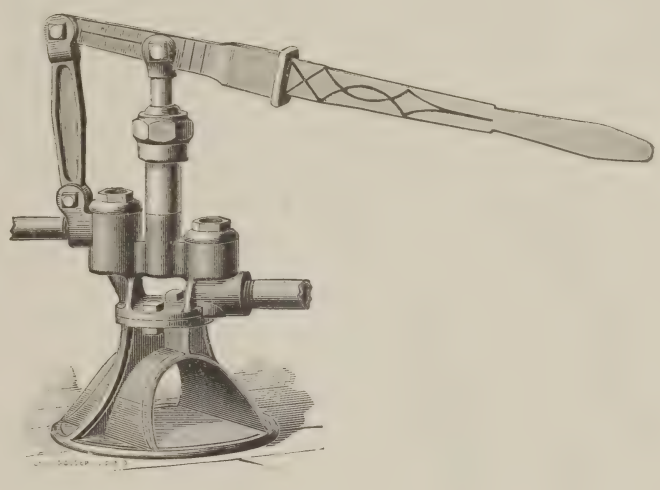
†It should be specified in ordering Fig. 515, if both upward and spout discharge are wanted for ¾-inch hose.

THE "LITTLE GIANT"

Hydraulic Pressure Test Pump.

FOR TESTING BOILERS, CYLINDERS, PIPES, ETC.

FIG. 566.



The cut above represents our new Hydraulic Pressure Test Pump, for determining the pressure strength of Boilers, Pipes, Pump Cylinders, etc. With this Pump and a suitable gauge, the pressure strength of boilers, etc., can be tested up to 800 pounds to the square inch. For the use of plumbers in forcing out waste water pipes, this Pump would be invaluable. The pump is furnished complete, as shown in cut, without Hydraulic Gauge.

The suction is fitted for ¾-inch and the discharge for ½-inch pipe. The working parts of the "Little Giant" Test Pumps are made entirely of bronze. Prices of Hydraulic Gauges furnished on application.

Sizes and Prices.

No.	Size of Piston.	Length of Stroke.	Length of Lever.	Suction for Pipe.	Discharge for Pipe.	Price, without Gauge.	Price, with Gauge.
1	⅞ in.	3 inches.	24 inches.	¾ in.	½ in.	$25.00.	On Application

The Deming Hydraulic Pump.

WITH BRACKETS AND DRIP PAN,

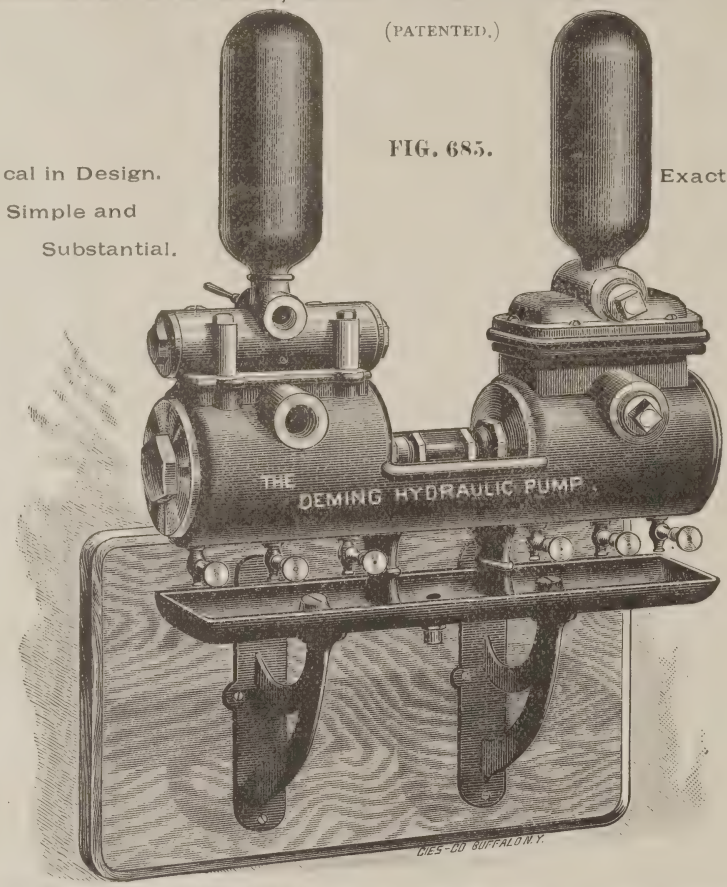
BRASS-LINED CYLINDERS, BRASS WATER CHAMBER AND VALVES.

(PATENTED.)

Symmetrical in Design.
Simple and
Substantial.

FIG. 685.

Exact in its Action.
Efficient.
Economical.



The Hydraulic Pump represented above is adapted for elevating water by hydraulic pressure, obtained from the Water Works supply, or from a Wind Mill Tank. In general construction this machine is similar to a small Steam Pump. Both the Power and Pump Cylinders are brass-lined, and have drip-cocks to prevent freezing. The Air Chambers relieve the Pump of sudden jars and give it smoothness of motion.

Where the Water Works supply is hard or contains impurities, this machine is useful in supplying a house tank with pure cistern or well water. In connection with an Automatic Cut-off the Pump will force water direct into the Pipe System for both *hot* and *cold* water supply, thus dispensing with the tank.

The working parts of the Deming Hydraulic Pump are made of the *best quality of Brass*, which prevents corrosive action of the water. It has *fewer parts* than any machine of the kind manufactured. All parts are interchangeable, and repairing may be done with facility. The three sizes are suitable for various pressures: No. 1, for heavy pressure; No. 2, for medium pressure, and No. 3, for light pressure.

In general it may be estimated that No. 1 will elevate water *as many feet;* No. 2, *one and one-half times as many feet;* and No. 3, *twice as many feet*, as there are pounds pressure to the square inch at the Pump. With *ample pressure* No. 1 is the *most economical*, since it uses the same amount of water as it discharges from the Pump.

Sizes and Prices.

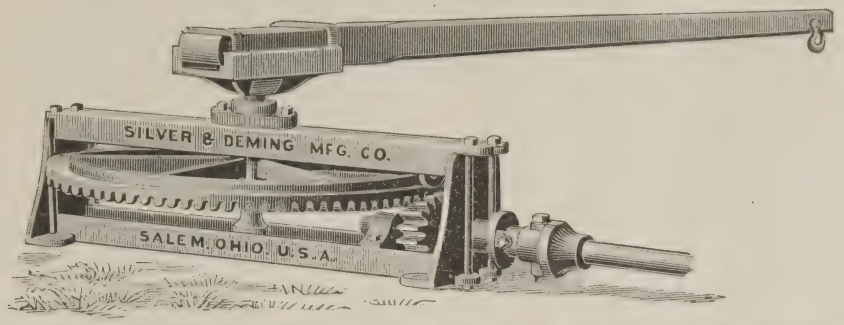
No.	Power Cylinder.			Pump Cylinder.			Stroke	Extreme Dimensions.		*Without Plank.		*With Plank.	
	Diam.	Supply.	Waste.	Diam.	Suction.	Dis.		Length.	Height.	Cipher.	Price.	Cipher.	Price.
1	2½ in.	⅜ in.	½ in.	2½ in.	¾ in.	¾ in.	3 in.	16 in.	15½ in.	Keeper	$40.00	Kingdom	$42.00
2	3 "	⅜ "	½ "	2½ "	¾ "	¾ "	3 "	16 "	15½ "	Kidnap	40.00	Knavish	42.00
3	3 "	⅜ "	½ "	2 "	¾ "	¾ "	3 "	16 "	15½ "	Kindred	40.00	Koran	42.00

*Always furnished without Plank unless otherwise ordered.

Improved Horse Power.

FOR OPERATING PUMPS.

FIG. 700.



The above cut represents a Single-geared Sweep Horse Power, **Fig. 700**, which is adapted for operating Pumps or light Farm Machinery. **Fig. 613**, on page 131, represents the method of attaching to and operating our Horizontal, Double-acting "Triumph" Force Pump. Pumping Jack, **Fig. 701**, illustrated below, may be used with Horse Power to operate a Deep Well Pump. The cut shows **Fig. 700** arranged for one horse; they are also furnished for two horses. A Coupling Joint, with short stub, is furnished for attaching to the Horizontal Shaft.

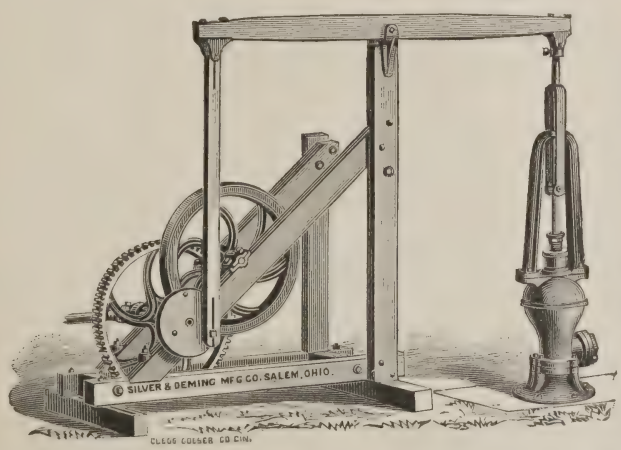
Sizes and Prices.

No.	* Arranged For	Length Levers.	Revolutions of Pinion to one of Large Wheel.	Cipher.	Price.
1	1 Horse.	10 feet.	6 Revolutions.	Huddle	$40.00
2	2 Horses.	10 "	6 "	Hulled	50.00

Horse-Power Pumping Jack.

FOR OPERATING DEEP WELL PUMPS.

FIG. 701.



The annexed cut represents **Fig. 701**, our Improved Pumping Jack, to be operated by Horse Power for pumping water from deep wells, by attaching to a Working Head or Wind Mill Pump Standard. This machine is furnished with attachments (Coupling Joint and Stub Rod) for connecting to the Tumbling Rod of a Horse Power; or, if preferred, it will be furnished with Pulley instead (at the additional price in list below) for running by belt direct from an Engine, or from a Pulley on a Shaft. This machine is provided with a Fly-wheel, geared high to regulate the stroke of Pump and cause it to work smoothly. **Fig. 701** is adapted for pumping on extensive ranches, and may be used with **Figs. 432, 433, 435, and 436**, or any of our Wind Mill Standards, in connection with a suitable Cylinder or Working Barrel. The cut shows the Pumping Jack, with **Fig. 435** attached, but the machine is furnished as listed below, *without Pump*.

Sizes and Prices.

No.	* Adapted For	Stroke Adjustable.	With Coupling Joint and Stub.		With Pulley for Steam Power.	
			Cipher.	Price	Cipher.	Price.
1	1 or 2 Horse Power.	6, 10, and 16 inches.	Hummer	$ 90.00	Humane	$100.00
2	4 Horse Power.	10, 16, and 24 "	Humming	110.00	Humanity	120.00

* For larger and more powerful Horse Powers than **Fig. 700**, illustrated above, see page 199.

DESCRIPTION

OF THE

Silver & Deming Hydraulic Ram.

Every two feet of a perpendicular column of water developes about one pound pressure to the square inch; for instance, a column of water ten feet high would give about five pounds pressure; one fifteen feet high, seven and one-half pounds pressure to the square inch, and so on.

Water running down an inclined surface, or through an inclined pipe, increases in speed until a certain amount of friction is developed, which tends to hold the water at the same velocity.

The power which operates a Hydraulic Ram is created by the fall and velocity of the water that is supplied to it; hence it is necessary to have a fall or head of water the same as if a small WATER WHEEL were to be operated, the water proceeding through a Supply Pipe to the Ram at an incline, and at a distance great enough to give the required velocity.

The Drive or Supply Pipe should be placed at an angle of not more than thirty degrees, in order to give the best results; and the length of Drive Pipe may vary from twelve to one hundred feet in length. As a general thing it should not be less than three fourths of the height to which the water is to be raised, or five times the head, or height of the supply; the length may, however, be much greater than this where it is necessary in locating the Ram to obtain the desired amount of fall.

In both Supply and Discharge Pipes all acute angles should be avoided. If the descent from Reservoir to Ram is greater than thirty degrees, a number of coils may be made in the Drive Pipe to compensate for this difference.

These conditions being obtained, the water can be discharged to an elevation several times the fall of water from the Reservoir to the Ram; the greater fall of water causing discharge of the greater amount of water at a given height, or a given amount of water at a greater height.

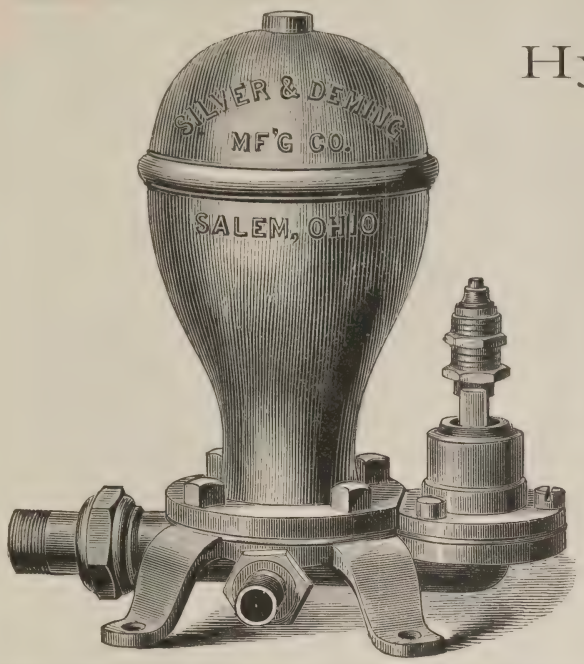
About one seventh of the water furnished to the Ram may be raised to a height four times that of the height of supply; one fourteenth to eight times the height of supply; one twenty-eighth to sixteen times the height of supply, and so on.

In examining the construction of the Hydraulic Ram, it will be seen that the Impetus Valve (the waste, or outside valve) closes as it is forced up, and opens as soon as the pressure is taken from under it. The Valve in the Air Chamber opens when the water is forced against it from below, and is closed by the atmospheric pressure in the Air Chamber.

When the conditions mentioned above can be obtained, the water, when introduced into the Supply Pipe, flows down to and through the Impetus Valve until it has acquired sufficient power by its velocity to throw this valve up and close it. The force of the water continues, and it finds an outlet through the valve in the Air Chamber, which opens, compressing the air until its power is equal to that of the head of water; this closes the Air Chamber Valve and thus confines the water which has been let in; at the same time the Impetus Valve opens, as the pressure of the water in the Supply Pipe has been overcome by the compressed air in the Air Chamber, and the water commences to waste as before. While water is wasting from the Impetus Valve the expansion of the air in the Air Chamber forces the water out through the Discharge Pipe; and this operation will continue as long as the working parts of the machine are in perfect condition. As the height to which water must be elevated by the Ram increases, the amount discharged will decrease.

With twelve feet of fall a Ram will deliver about one twentieth of the water supplied to it, to a point required, not exceeding 120 feet vertical distance, and to a horizontal distance of 1,000 feet or more. With the same fall, and less height to deliver the water, the efficiency of the Ram increases. With fifty feet of height the water is to be elevated, twice as much water will be discharged as at 100 feet if the amount of fall is the same. Also, with twenty feet fall a Ram would raise about as much water 100 feet as would the same Ram raise it to fifty feet with ten feet fall. With twelve feet of fall the Ram will elevate water to 120 feet, or even higher, though the amount of water discharged will decrease as the height increases until at about fifteen times the height of fall the machine will cease to operate.

For the convenience of those who are interested in this subject, we append the table on next page, SHOWING EFFICIENCY OF THE HYDRAULIC RAM.



Hydraulic Ram.

FOR ELEVATING WATER.

FIG. 690.

In locating the Ram all turns or angles in the Discharge Pipe should be avoided; a pit should be dug in which the Ram should be placed, in order that it be not affected by the frost. From the pit a drain should be arranged to carry off the waste water.

A Reservoir should be constructed giving the greatest fall or head of water through the Drive Pipe to the Ram.

Our Rams are made of Iron and Bronze. The Valve Stem and Case of the Impetus or Waste Valve, are always made of Bronze, which is the best material for the purpose.

For further particulars concerning the Hydraulic Ram, we refer to the description on the preceding page.

Sizes and Prices.

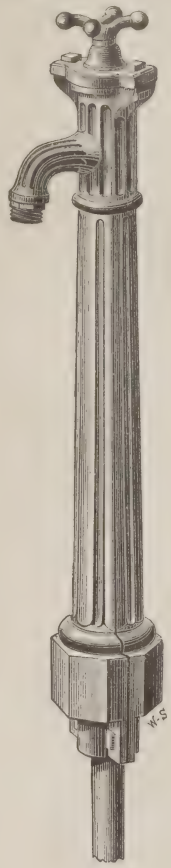
No.	Quantity of water furnished by the Reservoir to which the Rain is adapted.	Length the Drive Pipe should be.	CALIBER OF PIPE. Drive.	CALIBER OF PIPE. Discharge.	Cipher.	Price.
2	½ to 2 gallons per minute.	12 to 50 feet.	¾ inch.	½ inch.	Hautboy	$ 9.00
3	1½ " 4 " " "	12 " 50 "	1 "	½ "	Havoc	11.00
4	3 " 7 " " "	12 " 50 "	1½ "	¾ "	Haversack	14.00
5	6 " 14 " " "	25 " 100 "	2 "	1 "	Hawser	22.00
6	12 " 25 " " "	25 " 100 "	2½ "	1¼ "	Hazard	40.00
7	20 " 60 " " "	25 " 125 "	4 "	2 "	Hazardous	75.00
8	30 " 120 " " "	25 " 150 "	6 "	2½ "	Headlong	125.00

Table Showing Efficiency of the Hydraulic Ram.

Minimum Fall of Water, in feet, under which Ram will effectively elevate water to height given below.	2	2	2	3	4	5	6	7	8	10	12
Height, in feet, the water may be elevated	4	6	8	15	24	35	48	63	80	100	120
Length of Drive Pipe, in feet	12	12	12	15	20	30	40	50	60	75	95
Number of times the height or elevation of discharge is greater than the fall	2	3	4	5	6	7	8	9	10	10	10
Proportion of water elevated or discharged by the Ram	$\frac{2}{7}$	$\frac{1}{5}$	$\frac{1}{7}$	$\frac{2}{17}$	$\frac{1}{10}$	$\frac{1}{12}$	$\frac{1}{14}$	$\frac{2}{81}$	$\frac{1}{17}$	$\frac{1}{18}$	$\frac{1}{20}$
Proportion of water wasted at the Impetus Valve, by the Ram.	$\frac{5}{7}$	$\frac{4}{5}$	$\frac{6}{7}$	$\frac{15}{17}$	$\frac{9}{10}$	$\frac{11}{12}$	$\frac{13}{14}$	$\frac{29}{31}$	$\frac{16}{17}$	$\frac{17}{18}$	$\frac{19}{20}$
Per cent of Useful Effect of Power expended . .	80	78	75	72	68	62	57	53	48	43	38

N. B.—The *length* of the Drive or Supply Pipe should not be less than ¾ of the height to which the water is to be raised, or 5 times the height of supply; it may, however, be longer. The Hydraulic Ram is *most efficient* when the *volume* of the *Air Chamber* is *equal* to the *volume* of the *Discharge Pipe*. The larger size Rams, when an abundance of water is supplied, are adapted for elevating to the greatest heights and longest distances. The Discharge Pipe should not be longer than 10 times the height of discharge.

FIG. 665.—Hydrant.



THE "ECLIPSE"

Hydrant and Street Washer.

WITH COMPRESSION ANTI-FREEZING VALVES.

FIG. 666.—Street Washer.

The annexed cuts represent the "Eclipse" Hydrant and Street Washer, which we can confidently offer to the trade with the assurance that they will give perfect satisfaction.

They possess the following points of excellence: Compression Anti-freezing Valve; the Valves and all working parts of brass; galvanized pipe is used; they close against a pressure and no water remains in the top working parts; cannot waste when open; waste positively open when Valve is closed; inlet for Iron or Lead Pipe; can be repaired without digging up; every Valve tested and free from flaws; simple, durable, reliable, and reasonable in price.

Sizes and Prices.

Length to set in the Ground.	¾ INCH OPENING.				1 INCH OPENING.				1¼ INCH OPENING.			
	Fig. 665.		Fig. 666.		Fig. 665.		Fig. 666.		Fig. 665.		Fig. 666.	
	Cipher.	Price.	Cipher.	Price	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
1½ foot.	Headman	$9.80	Headwork	$6.60	Heaping	$12.70	Heaved	$9.50	Hooding	$19.70	Horizon	$18.00
2 feet.	Headmost	10.10	Healed	6.85	Hearer	13.50	Heaving	10.25	Hoodwink	20.50	Horned	18.75
3 "	Headpiece	10.60	Healer	7.35	Hearing	14.30	Honor	11.10	Hoofless	21.80	Hornless	20.10
4 "	Headspring	11.00	Healing	7.75	Hearten	14.75	Honored	11.70	Hooky	22.25	Hornpipe	20.70
5 "	Headship	11.50	Health	8.25	Heartily	15.30	Honoring	12.00	Hoosier	22.80	Horny	21.00
6 "	Headstrong	12.10	Healthful	8.85	Heartless	16.00	Honorable	12.75	Hopped	23.75	Horology	21.75
8 "	Headway	13.50	Healthy	10.25	Hearty	18.50	Honorary	15.25	Hopeful	27.00	Horoscope	25.25
10 "	Headwind	16.00	Heaped	12.75	Heathen	21.00	Hooded	17.75	Hopeless	30.00	Horrible	28.75

Columbus Wrought-Steel Sinks.

FOR BUTLER'S PANTRY AND KITCHEN.

These Sinks are made from one plate of wrought-steel and are *lighter, stronger and more durable* than CAST-IRON SINKS. They will not break from HEAT, cold, or any *cause whatever*, which makes them desirable for shipping long distances. The Strainer and Coupling for pipe are attached firmly to the Sink. The entire Coupling is made of Brass threaded for Iron Pipe, and a Brass Soldering Tube is added for Lead Pipe.

Sizes and Prices.

Sizes and Styles of Steel Sinks.	Painted.		Galvanized.		Gray Enameled.		White Enameled.	
	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
16 x 24 x 6 kitchen.	Heaven	$1.80	Heedless	$4.00	Helpful	$ 6.50	Herbage	$ 7.50
18 x 30 x 6 "	Heavenly	2.50	Heiress	5.10	Helpless	8.50	Herbarium	10.00
18 x 36 x 6 "	Hebrew	3.00	Heliotrope	6.50	Hematite	9.50	Herculean	11.00
20 x 30 x 6 "	Hectic	3.00	Hellebore	6.25	Hemlock	9.00	Hereby	10.50
20 x 36 x 6 "	Hedge	3.70	Hellenic	7.75	Henbane	10.50	Heredity	12.00
20 x 40 x 6 "	Hedging	4.00	Hellish	8 50	Heptagon	11.50	Heresy	13.00
*14 x 20 x 6 oval.	Heedful	2 00	Helmet	3.50	Herald	5.50	Heretic	6.50

* *Oval Sinks*, with *patent overflow*, 50 cents each, extra list.

Plumbers' Cast-Iron Square Sinks.

FOR KITCHEN USE.

The Cast-iron Sinks are too well known to require any description from us. We append below price list of the different sizes in general use.

Sizes and Prices.

Size in Inches.	Depth.	Painted.		Galvanized.		Enameled.	
		Cipher.	Price.	Cipher.	Price.	Cipher.	Price.
13 x 19	5 inches.	Heritage	$1.25	Hilarious	$ 2.60	Hoiden	$ 4.75
14 x 20	6 "	Hermetic	1.50	Hilarity	3.20	Hoisted	6.00
15 x 23	6 "	Hermit	1.70	Himself	3.40	Hoisting	6.25
15 x 25	6 "	Hermitage	1.75	Hinder	3.60	Holder	6.50
15 x 27	6 "	Heroic	2.00	Hippodrome	4.25	Holding	7.25
16 x 24	6 "	Heroism	1.80	Hireling	4.00	Holiday	6.50
16 x 28	6 "	Herring	2.10	Hissing	4.50	Holiness	7.50
16 x 30	6 "	Hesitancy	2.25	Historian	4.75	Holland	7.75
18 x 30	6 "	Hesitate	2.50	Historical	5.10	Hollander	8.50
18 x 32	6 "	Heterodox	3.00	History	6.25	Holly	9.50
18 x 36	6 "	Hexagon	3.00	Histrionic	6.50	Homage	9.50
18 x 42	6 "	Hexagonal	4.00	Hitched	8.75	Homely	11.75
19 x 38	6 "	Hibernean	3 80	Hitching	8.00	Homeric	11.00
20 x 30	6 "	Hiccough	3.00	Hither	6.25	Homesick	9.00
20 x 36	6 "	Hickory	3.70	Hives	7.75	Homespun	10.50
20 x 40	6 "	Hidden	4.00	Hoary	8.50	Homestead	11.50
20 x 42	6 "	Hideous	4.25	Hobble	9.00	Homicide	12.00
22 x 42	6 "	Highly	4.25	Hobby	9.00	Hominy	12 00
24 x 48	6 "	Highness	5.75	Hobnob	12.25	Honesty	15.00
24 x 50	6 "	Highway	7.50	Hoggishly	16.00	Honey	18.00

Revised Price List of Wrought-Iron Pipe.

FOR STEAM, GAS AND WATER. ADOPTED SEPT. 18, 1889.

Inside Diameter.	PLAIN OR BLACK. Price per ft.	*Cipher.	GALVANIZED. Price per ft.	*Cipher.	Welded.	Thickness.	Weight per Foot.	Threads to the Inch.
⅛ inch.	$ .04	Allegheny	.....	.....	Butt	.068 in.	24 lbs.	27
¼ "	.04	Baltimore	$ .05	Amazon	"	.088 "	.42 "	18
⅜ "	.04½	Camden	.05½	Bay	"	.091 "	.56 "	18
½ "	.05½	Detroit	.07½	Colorado	"	.109 "	.84 "	14
¾ "	.07½	Erie	.09½	Danube	"	.113 "	1.12 "	14
1 "	.10½	Fairmount	.13½	Elbe	"	.134 "	1.67 "	11½
1¼ "	.14	Galena	.18½	Firth	"	.140 "	2.24 "	11½
1½ "	.23	Harrisburg	.26	Ganges	Lap	.145 "	2.68 "	11½
2 "	.30	Ithaca	.34	Hudson	"	.154 "	3.61 "	11½
2½ "	.47	Jamestown	.53	Indus	"	.204 "	5.74 "	8
3 "	.62	Kensington	.68	Juniata	"	.217 "	7.54 "	8
3½ "	.74	Lancaster	.88	Kanawha	"	.226 "	9.00 "	8
4 "	.88	Macon	1.03	Lake	"	.237 "	10.66 "	8
4½ "	1.06	Quincy	1.31	Miami	"	.247 "	12.34 "	8
5 "	1.28	Newark	1.60	Nile	"	.259 "	14.50 "	8
6 "	1.65	Oneida	2.00	Osage	"	.280 "	18.76 "	8
7 "	2.10	Paris	.....	Po	"	.301 "	23.27 "	8
8 "	2.75	Reading	.....	Rhine	"	.322 "	28.18 "	8
9 "	3.75	Salem	.....	Seine	"	.344 "	33.70 "	8
10 "	4.75	Troy	.....	Tweed	"	.366 "	40 06 "	8
12 "	7.00	Utica	.....	Ural	"	.375 "	49 00 "	8

*The Cipher words above refer to sizes of Pipe. The Pipe Cipher Code is for ordering quantities of Pipe and Casing by telegraph. Always write the Cipher word for quantity before Cipher word representing size of Pipe or Casing.

Price List of Well Casing.

Nominal Inside Diameter.	Actual Outside Diameter.	Nominal Weight per Foot.	†Cipher.	Price per Foot.
2 inches.	2¼ inches.	2.23 pounds.	Ashland	$0.25
2¼ "	2½ "	2.75 "	Ashtabula	.28
2½ "	2¾ "	3.00 "	Auglaize	.31
2¾ "	3 "	3.33 "	Belmont	.34
3 "	3¼ "	3.95 "	Columbiana	.38
3¼ "	3½ "	4.27 "	Coshocton	.43
3½ "	3¾ "	4.60 "	Cuyahoga	.45
3¾ "	4 "	5.33 "	Fayette	.52
4 "	4¼ "	5.50 "	Franklin	.56
4¼ "	4½ "	6.00 "	Geauga	.60
4½ "	4¾ "	6.50 "	Guernsey	.66
4¾ "	5 "	7.25 "	Hancock	.72
5 "	5¼ "	7.66 "	Harrison	.79
5⅛ "	5½ "	8.08 "	Hocking	.86
5⅝ "	6 "	9.35 "	Jefferson	1.00
6¼ "	6⅝ "	10.06 "	Licking	1.30
6⅝ "	7 "	12.45 "	Mahoning	1.45
7⅝ "	8 "	15.10 "	Paulding	1.85
8¼ "	8⅝ "	16.15 "	Pickaway	2.10
8⅝ "	9 "	17.25 "	Portage	2.25
9⅝ "	10 "	19.00 "	Richland	2.75

† In ordering Well Casing by telegraph, the "Pipe Cipher Code" should be used in same ways as in ordering Pipe.

Pipe Cipher Code.

No. of feet.	Cipher.	No. of feet.	Cipher.	No. of feet.	Cipher.	No. of feet.	Cipher.
100	Asia	700	Germany	4000	Maine	10000	Texas
200	Belgium	800	Holland	5000	Nevada	15000	Uruguay
300	Chili	900	Ireland	6000	Ohio	20000	Valparaiso
400	Denmark	1000	Japan	7000	Peru	25000	Washington
500	Egypt	2000	Kentucky	8000	Russia	30000	Xenia
600	France	3000	Liberia	9000	Spain	40000	Yorkville

Revised Price List of Pipe Fittings.

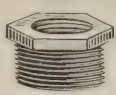
Sizes, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Elbows, Cast	.04	.05	.06	.09	.13	.20	.25	.40	.75	1.10	1.35	1.80	2 50	2.85	3.90
" " 45°	.10	.10	.10	.15	.20	.26	.35	.50	1.30	1.60	1 90	2.50			
" " R. & L.	.05	.06	.07	.11	.16	.23	.29	.46	.85	1.25	1.50	2.10			
" Malleable	.05	.07	.09	.15	.22	.32	.38	.60	1.25	1.75	2 10	4.00			
" Galvanized	.06	.09	.12	.18	.30	.45	55	.85	1.60	2 35	3 10	4.10			

Tees, Cast	.06	.07	.09	.13	.20	.30	.38	.60	1.10	1.50	2 00	2.50	3.50	4.00	5.50
" Reducing			.11	.15	.23	.35	.44	.70	1.25	1.75	2.30	2.90	4.00	4.60	6.35
" Malleable	.07	.07	.09	.18	.29	.40	.48	.75	1.40	2.10	2.50	4.15			
" Galvanized	.07	.10	.14	.20	.36	.55	.85	1.20	2.25	2.85	3 80	5.25			

Crosses, Cast	.08	.10	.12	.18	.28	.40	.50	.80	1.50	2.20	2.70	3.50	5.00	5.70	7.80
" Reducing	.10	.12	.14	.21	.32	.46	.58	.92	1.70	2.50	3.00	4.00	6.00	6.60	9.00
" Malleable	.08	.10	.12	.20	.30	.42	.55	.85	2 00	3 10	4.00	5.75			
" Galvanized		.15	.20	.32	.50	.80	1.00	1.60	3.00	4.25	5 5	7.00			

Couplings, Wrought	.05	.06	.07	.10	.13	.17	.21	.28	.40	.60	.80	1.00	1.50	1.65	2.40
" Galvanized	.06	.08	.10	.13	.18	.25	.32	.40	.55	.80	1.05	1.40	2.00	2.25	3.25
" Mal. R. & L.	.04	.05	.09	.12	.18	.25	.36	.52							
" Galv. "	.08	.10	.13	.20	.25	.35	.50	.75							

Nipples, Short	.05	.06	.07	.09	.10	.14	.17	.25	.56	.75	1.00	1.25	1.75	2.00	2.75
" Long	.07	.09	.10	.11	.15	.20	.25	.35	.75	.95	1.25	1.60	2.25	2.60	3.60
" Short, Galv.	07	.08	.09	.11	.13	.17	.23	.32	.65	1.00	1.25	1.45			
" Long, "	.09	.11	.13	.16	.19	.24	.31	.40	.85	1.20	1.50	1.90			



Bushings, Plain		.05	.06	.07	.09	.13	.17	.27	.42	.60	.80	1.00	1.50	1.85	2.50
" Galvanized		.06	.07	.10	.14	.21	.30	.44	.59						

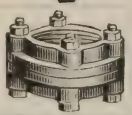
Plugs, Plain	.03	.03	.04	.05	.06	.10	.13	.20	.35	.50	.75	.85	1.35	1.75	2.40
" Galvanized	.05	.05	.06	.08	.10	.15	.23	.35	.57	95	1.35	1.60	2.35	3.45	4.65

Reducers, Cast									.75	1.20	1.50	2.00	2 75	3.00	4.00
" Malleable		.06	09	.12	.18	.25	.36	.50							
" Galvanized		.08	.11	.16	.25	.35	.45	.75	1 05	1.65	2.40	3 05			

Caps, Cast													1.60	2.00	2.35
" Malleable	.03	.04	.05	.08	.12	.16	.24	.32	.45	.70	.85	1.20			
" Galvanized	.05	.05	.08	.12	.16	.24	.38	.52	.76	1.15	1.40	2.00			

Locknuts, Malleable	.04	.04	.06	.07	.08	.10	.12	.25							
" Galvanized	.05	05	.07	.09	.10	.12	.16	.32							
" Cast									.40	.50	.70	.95	1.25	1.35	1.90

Unions, Malleable	.15	.18	.20	.28	.34	.46	.60	.80	1.50	2.10	3 00	4.00			
" Galvanized	.20	.24	.27	.37	.50	.70	.90	1.20	2.25	2.90	4.50	5.60			

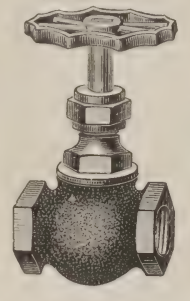


Flanged Unions				.65	.70	.85	1.15	1.50	1.75	2.25	2.75	3.15	4.50	5.00	6.50

Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Standard Length	2½	3	3½	4	4½	5	5½	6	7	8
Long Screws, price each	.30	.35	.40	.55	.75	1.00	1.30	1 70	2.70	3.70

Brass Goods.—Valves.

FIG. 900.

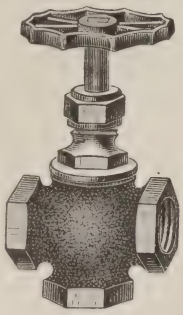


Globe and Angle Valves.—Figs. 900 and 901.

FIG. 901.

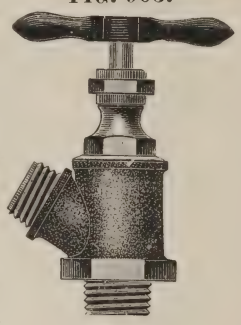
Size, inches	⅛	¼	⅜	½	¾	1
Price, each	$0.60	.60	.75	1.00	1.35	1.80
Size, inches	1¼	1½	2	2½	3	
Price, each	$2.80	3.90	5.90	11.25	16.00	

FIG. 902.



Cross Valves.—Fig. 902.

FIG. 903.



Size, inches	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$1.00	1.50	2.00	2.50	3.50	5.00	8.00	16.00	24.00

Hose Valves.—Fig. 903.

Size, inches	1	1¼	1½	2	2½
Price, each	$3 25	4.00	5.50	7.00	10.00

Horizontal Check Valves.—Fig. 904.

FIG. 904.

Size, inches	⅛	¼	⅜	½	¾	1
Price, each	$0.50	.50	.60	.85	1.15	1.55
Size, inches	1¼	1½	2	2½	3	
Price, each	$2.30	3.25	5.20	10.00	14.00	

FIG. 905.

Vertical Check Valves.—Fig. 905.

Size, inches	¼	⅜	½	¾	1	1¼	1½	2
Price, each	$0.50	.60	.85	1.15	1.55	2.30	3.25	5.20

FIG. 906.

Low Pressure Safety Valves.—Fig. 907.

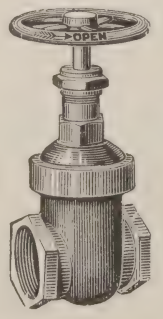
FIG. 907.

Size, inches	¾	1	1¼	1½	2
Price, each	$2.50	3.00	4.00	5.00	6.50

Standard Safety Valves.—Fig. 906.

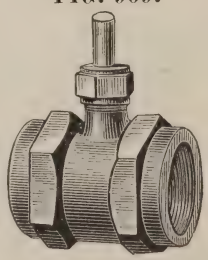
Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$2.00	2.25	2.75	3.50	5.00	7.00	8.50	12.00	20.00	30.00

FIG. 908.



Straight Way Double Gate Valves.—Fig. 908.

FIG. 909.



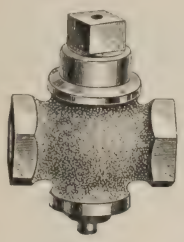
Size, inches	½	¾	1	1¼	1½	2	2½	3
Price, each	$1.20	1.75	2.50	3.50	5.00	7.50	14.00	19.50

Butterfly Valves.—Fig. 909.

Size, inches	1	1¼	1½	2	2½	3
Price, each	$3.50	4.50	5.50	8.00	11.00	16.00

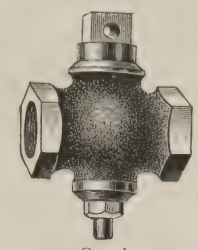
Brass Goods.—Cocks.

FIG. 910.



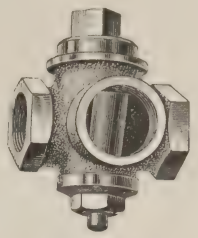
Steam.

FIG. 911.



Service.

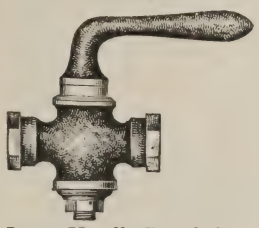
FIG. 912.



Three-Way.

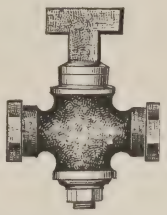
Size, inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Steam Cocks, Square Head . . each,	$0.70	$0.75	$1.10	$1.50	$2.25	$3.75	$4.80	$7.25	$14.00	$20.00
" " Flat " . . "	.70	.75	1.10	1.50	2.25	3.75	4.80	7.25	14.00	20.00
" " Sq. Hd. with Check, "			1.20	1.65	2.45	4.00	5.10	7.65	14.50	20.75
Three-Way Cocks . . . . . "			1.75	2.40	3.60	5.75	7.30	10.40	18.50	26.75
Gas Service Cocks . . . . . "	.55	.65	.75	1.00	1.40	2.20	3.00	5.00		

FIG. 913.



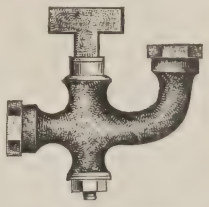
Lever Handle Rough Stop.

FIG. 914.



T Handle Rough Stop.

FIG. 915.



T Handle Hydrant.

Size, inches	½	¾	1	1¼	1½	2
Rough Stops, Lever or T Handle, per doz.	$13.00	$21.00	$31.00	$50.00	$70.00	$120.00
" " with Check and Waste "	14.00	22.50	33.00	53.00	74.00	130.00
Hydrant Cocks, " " " "	15.00	23.00	36.00	60.00		

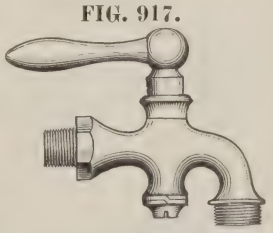
FIG. 916.

Lever Handle Plain Bibb.

Lever Handle Bibb Cocks, for Iron Pipe.

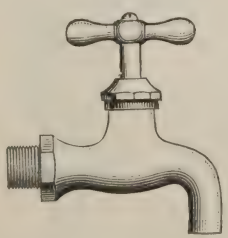
Size, inches . . .	⅜	½	¾	1	1¼	1½	2
Plain Rough } per doz	12.00	15.00	23.00	35.00	56.00	78.00	160.00
Plain Fin'd } per doz	13.00	16.00	26.00	39.00	64.00	90.00	180.00
Hose Rough } per doz	. . .	16.00	25.00	38.00	60.00	84.00	170.00
Hose Fin'd } per doz	. . .	17.00	28.00	42.00	68.00	96.00	190.00

FIG. 917.



Lever Handle Hose Bibb.

FIG. 918.

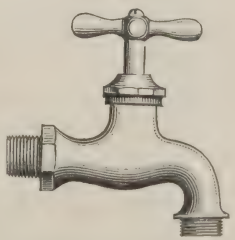


T Handle Compression Plain Bibb.

Compression Bibb Cocks, for Iron Pipe.

Size, inches	⅜	½	¾	1	1¼	1½
Plain Rough, per doz.	$9.50	$10.50	$19.00	$33.00		
" Finished, " "	10.00	11.00	20.00	37.00		
Hose Rough, " "	. . .	11.50	21.00	36.00		
" Finished, " "	. . .	12.00	22 00	40.00		

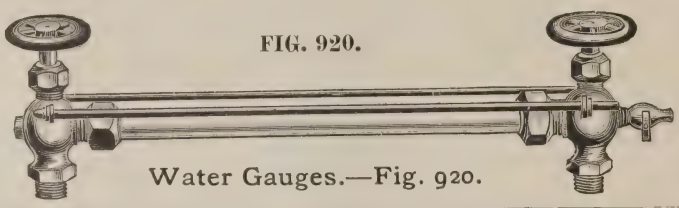
FIG. 919.



T Handle Compression Hose Bibb.

Brass Goods.—Engine.

FIG. 920.



Water Gauges.—Fig. 920.

No. 1,	Round, Rough Body, Two Rods,	5/8 x 12	Glass, for 1/2 inch Pipe, each		$3.00
No. 2,	Square Finished " " "	5/8 x 12	" " 1/2 " " "		5.75
No. 3,	" " " Four "	5/8 x 12	" " 1/2 " " "		6.00
No. 4,	Round " " Two "	3/4 x 16	" " 3/4 " " "		8.00
No. 5.	" " " Three "	3/4 x 16	" " 3/4 " " "		10 00

No. 1, Heads with Iron Wheels. Nos, 2, 3, 4 and 5, Wood Wheels.

FIG. 921.

FIG. 922.

Steam Whistles.—Figs. 921 and 922.

Diameter of Bell, inches.	1	1¼	1½	2	2½	3	3½	4	5	6
Size of Pipe, inches.	¼	⅜	⅜	¾	¾	1	1	1¼	1½	2
Fig. 921, With Valve, price, complete, each	3.50	3.75	4.00	4.75	6.50	8.00	11.00	14.00	22.00	30.00
Fig. 922, Without Valve," " "	1.70	2.00	2.50	3.25	4.50	6.00	8.50	11.00	18.00	24.00
Valve only.			2.00	2.25	2.75	3.25		4.00	5.50	9.50

Mississippi Gauge Cocks.—Fig. 923.

Size for Iron Pipe	⅜	½	½	¾
Blank Shank	⅝	¾	⅞	1
Price, each.	$ .75	$1.00	$1.25	$1.50

FIG. 923.

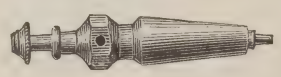
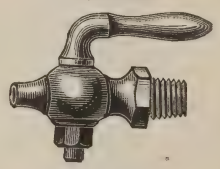


FIG. 924.



Air Cocks.—Fig. 924.

Size Chased, Iron Pipe, Inches	⅛	¼	⅜	½
T Handle, ... Each	$ .40	$ .45	$ .50	$ .60
Lever Handle, . . . Each	. . .	.95	1.00	1.15

FIG. 925.

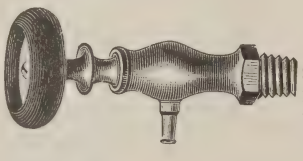
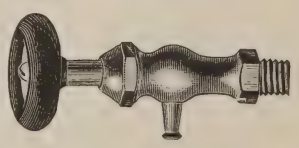


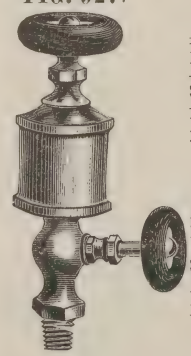
FIG. 926.



Compression Gauge Cocks.

Size Chased, Iron Pipe, Inches,	⅜	½	¾
Fig. 925, No. 1, Without Stuffing-Box	.80	.85	. . .
Fig. 926, No. 4, With " "	1 10	1.15	1.25

FIG. 927.



Lubricators.—Fig. 927.

Diameter of Body, inches . . .	¾	1	1¼	1½	1¾	2	2¼	2½	3
Size Chased, Iron Pipe, inches.	¼	¼	⅜	⅜	½	½	½	½	¾
Price, each	1.75	2.00	2.20	2.40	2.60	2 90	3.25	3.75	4.75

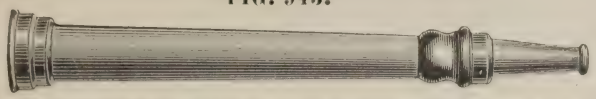
FIG. 928.

Oil Cups.—Fig. 928.

Diameter of Body, inches. . .	¾	⅞	1	1⅛	1¼	1½	1¾	2	2¼	2½	3
Size Chased, Iron Pipe, inches.	⅛	⅛	¼	¼	¼	⅜	⅜	⅜	½	½	¾
Price, each	.30	.35	.40	.50	.60	.90	1.25	1 75	2.25	2.75	4.50

Brass Goods.—Hose.

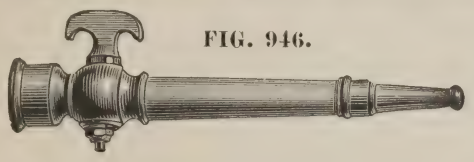
FIG. 945.



Hose Pipes. Screw Tip.—Fig. 945.

Size, Inches	¾	¾	1	1	1¼	1¼	1½	1½	2	2½
Length, inches	7½	12	8½	12½	11	17	13	19	20	24
Price, each	$0 65	.85	.85	1.25	1.65	2.50	2.10	4.00	5.00	8.50

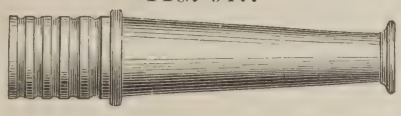
FIG. 946.



Hose Pipes, with Cock.—Fig. 946.

Size, Inches	¾	¾	¾	1	1¼	1½	2
Length, inches	6¾	8	12	9½	20	22½	25
Price, each	$0.95	1.10	1.50	1.70	4.60	7.00	10.00

FIG. 947.



Hose Nozzles, to Tie on.—Fig. 947.

Size, Inches	¾	1	1¼
Length, inches	5½	6	6¾
Price, each	$0.40	.65	1.00

FIG. 948.—Throwing Spray.

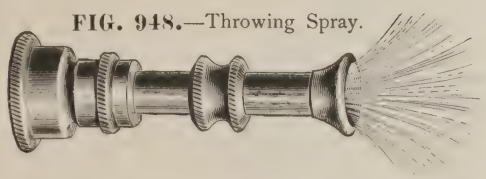
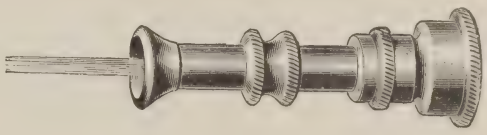


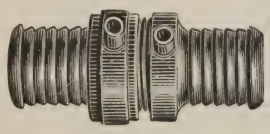
FIG. 948.—Throwing Solid Stream.



"Gem" Hose Nozzles.—Fig. 948.

Size, inches	¾	1
"Gem" Hoze Nozzles, with graduating spray. Price, each	$0.75	1.00

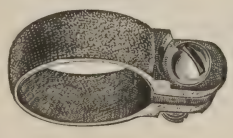
FIG. 949.



Hose Couplings.—Fig. 949.

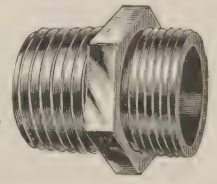
Size, Inches	½	¾	1	1¼	1½	2	2½	3
Complete. Price, each	$0 20	.20	.38	.85	1.20	2 00	4.00	6.35
Half Coupling (Female). Price, each	$0.15	.15	.25	.60	.80	1.35	2.65	4.25

FIG. 950.



Hose Clamps and Hose Nipples.

FIG. 951.



Size, Inches	½	¾	1	1¼	1½	2	2½	3
Clamps, Fig. 950, per pair	$0 25	.25	.35	.45	.50	.70	1.20	1.65
Nipples, Fig. 951, each	.30	.30	.42	.75	.85	1.20	2.35	3.35

Caldwell's Hose Bands.

No. 2, For ½ in. Hose, 3⅜ inches long, per doz.	$0.40	No. 10, For 1 in. Hose, 5 inches long, per doz.	$0.80
No. 4, For ½ " " 3¾ " " "	.40	No. 12, For 1 " " 5⅜ " " "	.80
No. 6, For ¾ " " 4⅛ " " "	.60	No. 14, For 1¼ " " 6 " " "	1.00
No. 8, For ¾ " " 4½ " " "	.60	No. 16, For 1¼ " " 6⅜ " " "	1.00

Hose Strap Fasteners.—No. 1. ½ inch to 1 inch inclusive, 50 cents. No. 2. 1¼ inch to 2½ inch inclusive, 75 cents.

Price List of Rubber Hose.

Internal Diameter.	2-ply Conducting. Price, per foot.	3-ply Hydrant. Per foot.	4-ply Engine. Per foot.	Steam and Air Brake Hose.		Suction Hose.	
				4-ply, per foot.	5-ply, per foot.	Hard Rubber. Per foot.	On Spiral Brass Wire, per foot.
½ inch.	$0.20	$0 25	$0.30	$0.51	$0.64	. . . . .	. . . . .
¾ "	.25	.30	.37	.67	.84	$0.75	$0.77
1 "	.33	.40	.50	.83	1.05	.75	1.00
1¼ "	.42	.50	.62	1.04	1.30	.93	1.25
1½ "	.50	.60	.75	1.25	1.56	1.13	1.65
2 "	.66	.80	1.00	1.66	2.08	1.50	2.50
2½ "	.83	1.00	1.25	. . . . .	. . . . .	. . . . .	3.10
3 "	.99	1.20	1.50	. . . . .	. . . . .	. . . . .	4.00
3½ "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	4.90
4 "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	5.80
4½ "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	6.70
5 "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	7.60
5½ "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	8.50
6 "	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	9.50

Rubber and Leather Belting.

Width of Belting.	* RUBBER BELTING. (Cotton Duck Body.)			OAK-TANNED LEATHER BELTING.	
	2-ply, per foot.	3-ply, per foot.	4-ply, per foot.	Single Belt, per foot.	Double Belt, per foot.
1 inch.	$0.07	. . . . .	. . . . .	$0.10	. .
1¼ "	.09	. . . . .	. . . . .	.13	. .
1½ "	.11	$0.13	. . . . .	.17	. .
2 inches.	.15	.17	. . . . .	.23	$ .46
2½ "	.18	.22	. . . . .	.30	.60
3 "	.22	.26	$0.31	.36	.72
3½ "	.26	.30	.37	.43	.86
4 "	.30	.34	.42	.50	1.00
4½ "	. . . . .	.39	.47	.56	1.12
5 "	. . . . .	.43	.52	.63	1.26
5½ "	. . . . .	.48	.57	.70	1.40
6 "	. . . . .	.52	.62	.76	1.52
7 "	. . . . .	.60	.73	.90	1.80
8 "	. . . . .	.70	.84	1.02	2.04
9 "	. . . . .	.80	.95	1.15	2.30
10 "	. . . . .	.90	1.07	1.29	2.58
11 "	. . . . .	1.00	1.18	1.42	2.84
12 "	. . . . .	1.08	1.30	1.55	3.10
13 "	. . . . .	. . . . .	1.42	1.68	3.36
14 "	. . . . .	. . . . .	1.54	1.82	3.64
15 "	. . . . .	. . . . .	1.66	1.98	3.96
16 "	. . . . .	. . . . .	1.78	2.14	4.28
18 "	. . . . .	. . . . .	2.02	2.49	4.98
20 "	. . . . .	. . . . .	2.26	2.84	5.68
24 "	. . . . .	. . . . .	2.80	3.54	7.08
30 "	. . . . .	. . . . .	. . . . .	4.64	9.28
36 "	. . . . .	. . . . .	. . . . .	5.70	11.40
40 "	. . . . .	. . . . .	. . . . .	6.40	12.80

* The Rubber Belting is made with 30 oz. 42 inch Cotton Duck, manufactured for the purpose. Full Rolls measure 300 to 350 feet. Intermediate widths furnished at proportionate prices. Five and Six-ply Belts made to order at an advance of twenty-five and fifty per cent, respectively, on "Four-ply" prices.

Endless Rubber Belts furnished to order, for which three extra feet will be charged for the splice.

Lace Leather.

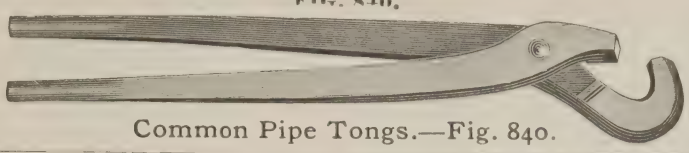
Width, in inches	¼	⅜	½	⅝	¾
Tanned Cut Lacing, price per 100 feet . .	$1.00	$1.50	$2.00	$2.75	$3.25
Rawhide " " " " 100 " . .	1.00	1.65	2.30	2.90	3.50

Tanned Lace Leather in sides, per pound $1.00
Rawhide " " " " per square foot 40

Genuine Oak-tanned Leather, for Pump Valves, in sides, per pound, $0.50.

Pipe Fitters' Tools.

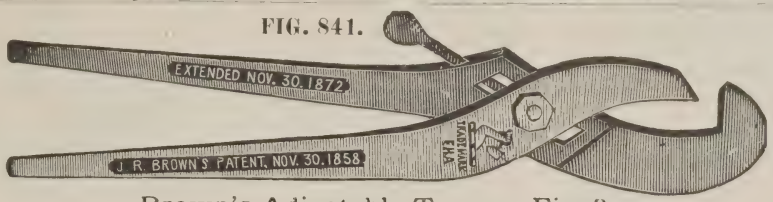
FIG. 840.



Common Pipe Tongs.—Fig. 840.

Size, for Pipe	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Price, each	$0.60	$0.65	$0.70	$0.75	$0.90	$1.10	$1.30	$1.50	$1.90	$2.50	$3.50

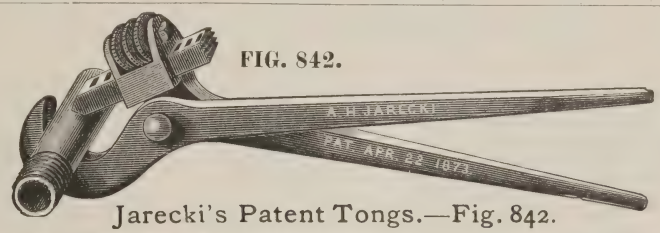
FIG. 841.



Brown's Adjustable Tongs.—Fig. 841.

Numbers	1	1½	2	3	4	5	6
Will Take Pipe from	⅛ to ¾	⅜ to 1	½ to 1¼	1 to 2	1½ to 3	2½ to 4	3 to 6
Price, each	$1.30	$1.65	$2.00	$3.00	$ 6.00	$11.00	$25.00

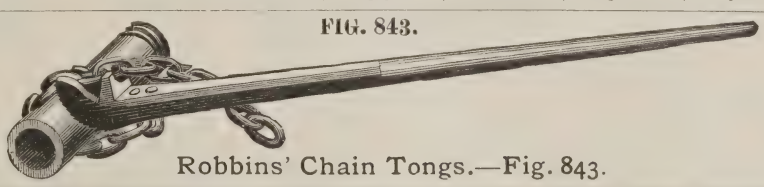
FIG. 842.



Jarecki's Patent Tongs.—Fig. 842.

Numbers	1	2	3	4	5
Will Take Pipe from	⅛ to 1	¼ to 1½	½ to 2½	¾ to 3½	2½ to 6
Price, each	$3.50	$4.00	$5.00	$9.00	$16.00

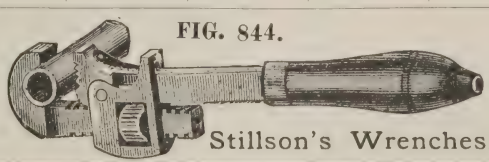
FIG. 843.



Robbins' Chain Tongs.—Fig. 843.

Numbers	2	3	4	5	6	7
Will Take Pipe from	1 to 2	1¼ to 4	2 to 6	2½ to 8	4 to 10	4 to 16
Price, each	$5.50	$6.25	$9.00	$12.50	$16.00	$30.00

FIG. 844.

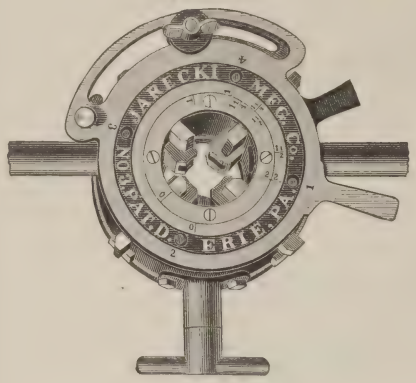


Stillson's Wrenches.—Fig. 844.

Length Open, inches	6	8	10	14	18	24	36
Wire Size to Pipe Size	⅛ to ½	⅛ to ¾	¼ to 1	¾ to 1½	¼ to 2	¼ to 2½	½ to 3½
Price, each	$2 00	$2.00	$2.25	$3 00	$4.00	$6.00	$12.00

Pipe Fitters' Tools.

FIG. 845.



Jarecki Screw Plate and Pipe Cutter.—Fig. 845.

No. 1	Cuts and Threads	¼, ⅜, ½, ¾	$14.00
No. 2	" "	½, ¾, 1, 1¼	16.00
No. 3	" "	1, 1¼, 1½, 2	20.00
No. 3½	" "	½, ¾, 1, 1¼, 1½, 2	22.50
No. 4 A	" "	1½, 2, 2½, 3	35 00
No. 4 B	" "	2½, 3, 3½, 4	50 00
No. 5	" "	4½, 5, 6	75.00

Numbers	1	2	3	3½	4 A	4 B	5
Extra Dies, per Set, Right or Left	$2.00	2.00	2.00	2 Sets 4.00	3 00	3.00	6 00
Extra Knives	.40	.40	.40	.40	.50	.50	1.00

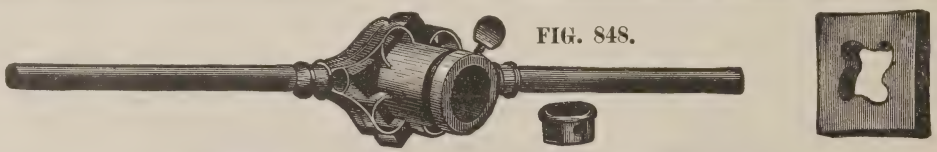
One set of Dies threads four sizes pipe. Extra Dies for Line Pipe and Casing Threads, furnished at an additional cost. The Nos. 1, 2, 3 and 3½ have Two Handles, Nos. 4 A and 4 B have Four Handles, No. 5 has Five Handles.

FIG. 847.

Miller's Ratchet Die Stocks.—Fig. 847.

Numbers	A	B	C	D	E
Dies with Each Stock	⅛ to ¾	¼ to 1	1 to 1½	1¼ to 2	2½ to 3
Dimensions of Dies	2 x ½	2½ x ¾	3 x ¾	4 x ⅞	5 x 1¼
Stock with Right Hand Dies complete	$13.00	$15.00	$18.50	$20.00	$43.00
Stock without Dies	7.50	8.50	13.00	13.50	29.00
Extra Dies, Right or Left Hand	1.10	1.50	1 80	2.50	7.00
Guides	.20	.25	.35	45	.75
Die Frames		.22	.30	.38	.45

FIG. 848.



Malleable Stocks with Solid Dies.—Fig. 848.

Numbers	1	1½	1¾	2	3
Pipe Sizes of Dies	¼, ⅜, ½ ¾, 1	¾, 1, 1¼	1, 1¼, 1½	1¼, 1½, 2	2½, 3
Dimensions of Dies	2½ x ¾	3 x ¾	3 x ¾	4 x ⅞	5 x 1¼
Complete with Right Hand Dies	$15.00	$13.50	$13.50	$20.00	$43.00
Stocks only	5.00	6.00	6.00	9.50	25.00
Extra Dies, Right or Left	2.00	2.50	2.50	3.50	9.00
Extra Guides	.35	.45	.45	.60	1.00
Die Frames	.30	.40	.40	.50	.60

FIG. 849—Tap.

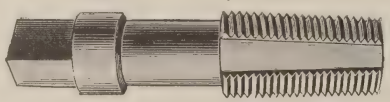


FIG. 850—Reamer.

Pipe Taps and Reamers.—Figs. 849 and 850.

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Taps, Right or Left	$1.12	1.25	1.50	1.87	2.50	3.12	3.75	4.65	6.25	10.50	15.00
Reamers	1.12	1.25	1.50	1.87	2.50	3.12	3.75	4.65	6.25	10.50	15.00

Pipe Fitters' Tools.

FIG. 851.

Taps and Dies.—Fig. 851.

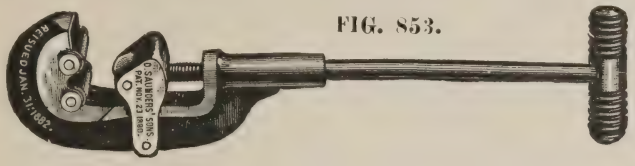
Dies and Guides, each	$1.20
Holders, each	.75
Taps, each	.65

FIG. 852.

Pump Rod Screw Plates.—Fig. 852.

No. 12.–2 pair Dies, cutting ⅜, 14; $\frac{7}{16}$, 12.	$5.00
No. 13.–3 pair Dies, cutting ⅜, 14; $\frac{7}{16}$, 12; ½, 12	6.00

FIG. 853.



Saunders' Cutters —Fig. 853.

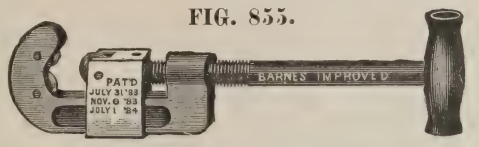
Numbers	1	2	3
Cuts Pipe from	⅛ to 1	1 to 2	2 to 3
Price Complete	$3.00	4.50	14.00
" Cutter Block & Wheels,	1.50	2.00	4.00
" " Wheels Only	.24	.32	.60
" Rollers Only	.24	.32	.50

FIG. 854.

Stanwood's Cutters —Fig. 854.

Numbers	1	2	3
Cuts Pipe from	⅛ to ¾	¾ to 2	2 to 3
Price Complete	$1 50	2.25	7.00
" Cutter Bl'k & Wheels,	.40	.60	1.00
" " Wheels Only	.12	.18	.25

FIG. 855.



Barnes' Pipe Cutters.—Fig. 855.

Numbers	1	2	3	4	5
Cuts Pipe, inches	⅛ o 1	½ to 2	1½ to 3	3 to 4	4 to 6
Price, each	$4.50	$6.00	$10 00	$20.00	$30.00
Extra Wheels, each	.25	.30	.40	.50	1 00
Wheel Pins, each	.10	.10	.10	.10	.20

FIG. 856.

Alligator Wrenches.—Fig. 856.

Length, inches	5¾	10	16	22	27
Takes Pipe	⅛ to ⅜	⅜ to ¾	½ to 1¼	1¼ to 2	2 to 3
Price, each	$0 33	$1.00	$2.00	$3.00	$4.50

Pipe Vises.

Numbers	1	2
Holds Pipe	⅛ to 2 in.	¼ to 3 in.
Smith's Vise	$16.00	$20.00
Swing Vise	10.00	14.00

FIG. 857.—Smith's Combination Vise.

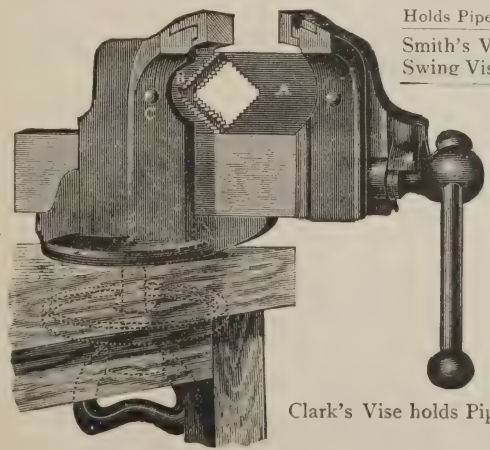
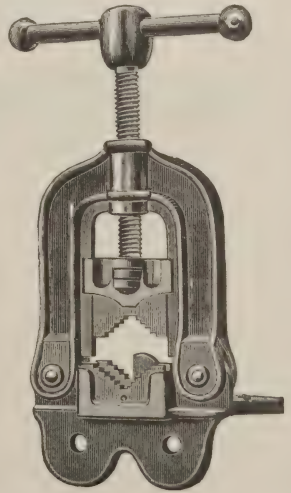


FIG. 858.—Clark's Vise.

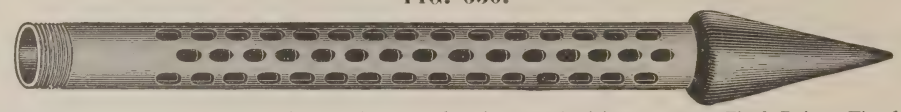
Clark's Vise holds Pipe up to 2 inch. Price, $3.00.

FIG. 859.—Swing Vise.



Brass Jacket Drive Well Points.

FIG. 630.



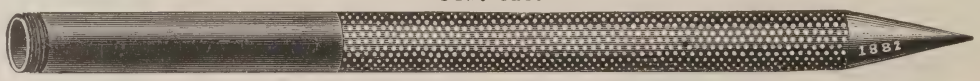
This cut shows the point uncovered. The Brass Jacket (or covering) is same as on Flush Points, Fig. 629.

Trade No.							Price per Dozen. No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.	No. 100 Gauze.
				1 Inch Points.—Galvanized.						
74	2	ft. long,	18	in. Jacket,	100	holes	$ 33.00	$ 40.00	$ 45.00	$ 48.00
76	2½	"	24	"	125	"	40.00	50.00	60.00	65.00
78	3	"	30	"	150	"	50.00	62.00	72.00	78.00
80	3½	"	36	"	175	"	58.00	72.00	82.00	90.00
82	4	"	42	"	200	"	67.00	82.00	94.00	102.00
				1 1-4 Inch Points.—Galvanized.						
86	20	in. long,	14	in. Jacket,	80	holes	30.00	36.00	42.00	48.00
90	2	ft. "	18	"	100	"	36.00	45 00	52.00	56.00
94	2½	"	24	"	125	"	45.00	56.00	64.00	70 00
98	3	"	30	"	150	"	54.00	68.00	80.00	86.00
100	3½	"	36	"	175	"	64.00	80.00	92.00	100.00
102	4	"	42	"	200	"	72.00	90.00	105.00	116.00
106	4½	"	48	"	250	"	81.00	104.00	122.00	134.00
110	5	"	54	"	300	"	90.00	114.00	128.00	146.00
114	6	"	66	"	325	"	102.00	130.00	145.00	166.00
				1 1-2 Inch Points.—Galvanized.						
136	2	ft. long,	18	in. Jacket,	125	holes	48.00	58.00	66.00	72.00
140	2½	"	24	"	170	"	57.00	70.00	80.00	86.00
144	3	"	30	"	200	"	66.00	82.00	94.00	102.00
146	3½	"	36	"	225	"	78.00	96.00	114.00	126.00
148	4	"	42	"	250	"	90.00	114.00	134.00	146.00
152	5	"	54	"	350	"	100.00	125.00	144.00	158.00
156	6	"	66	"	400	"	120.00	152.00	175.00	194.00
				2 Inch Points.—Galvanized.						
160	2	ft. long,	18	in. Jacket,	140	holes	75.00	88.00	98.00	104.00
164	2½	"	24	"	220	"	90.00	108.00	112.00	126.00
168	3	"	30	"	250	"	102.00	124.00	140.00	150.00
170	3½	"	36	"	275	"	118.00	144.00	162.00	174.00
172	4	"	42	"	300	"	132.00	162.00	184.00	198.00
176	5	"	54	"	350	"	162.00	200.00	230.00	248.00
180	6	"	66	"	400	"	200.00	250.00	290.00	316.00

The Length of Pipe given above does not include the Cast Point.

Brass Jacket Tubular Well Flush Points.

FIG. 629.

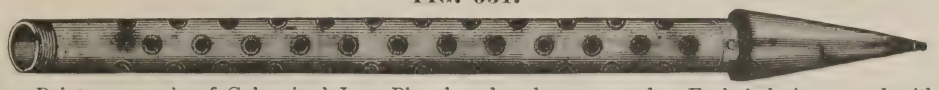


This Point is so constructed that it can be driven from the inside. The plug is securely riveted to the pipe.

							Price per Dozen. No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.	No. 100 Gauze.
				1 Inch Points—Galvanized.						
75	3	ft. long,	18	in. Jacket,	100	holes	$ 36.00	$ 44.00	$ 48.00	$ 52.00
79	4	"	30	"	150	"	53.00	65.00	75.00	81 00
83	5	"	42	"	200	"	70.00	85.00	97 00	105.00
				1 1-4 Inch Points—Galvanized.						
118	3	ft. long,	24	in. Jacket,	130	holes	49.00	60.00	68.00	74.00
122	3½	"	30	"	160	"	58.00	72.00	84.00	90.00
126	4	"	36	"	200	"	67.00	84.00	96.00	108.00
130	4½	"	42	"	230	"	76.00	94.00	110.00	120.00
134	51 in.	"	24	"	130	"	58.00	68.00	76.00	82.00
138	57	"	30	"	160	"	66.00	80.00	92.00	98.00
142	63	"	36	"	200	"	75.00	92.00	104.00	116.00

Washer Drive Well Points.

FIG. 631.



These Points are made of Galvanized Iron Pipe, bored and countersunk. Each hole is covered with gauze, held in its place by a brass washer, and riveted.

We use only the heaviest gauze, cut from new stock, in making these Points, and when gauze finer than No. 60 is required, we put a thickness of No. 60 gauze under the finer gauze to give the required strength.

Trade No.		Price per Dozen. No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.	No. 100 Gauze.
	1 1-4 Inch Points.—Galvanized.				
300	20 inches long, 50 holes	$ 30.00	$ 36 00	$ 42.00	$ 48.00
301	2 feet " 60 "	36.00	45.00	52.00	56.00
302	2½ " " 80 "	45.00	56.00	64 00	70.00
303	3 " " 100 "	54.00	68.00	80.00	86.00
304	3½ " " 120 "	64 00	80.00	92.00	100.00
305	4 " " 140 "	72.00	90.00	105.00	116.00
	1 1-2 Inch Points.—Galvanized.				
320	2 feet long, 80 holes	48.00	58.00	66.00	72.00
321	2½ " 110 "	57.00	70.00	80.00	86.00
322	3 " 130 "	66.00	82.00	94.00	102.00
323	3½ " 150 "	90.00	114.oc	134.00	146.00
	2 Inch Points.—Galvanized.				
324	2½ feet long, 140 holes	90.00	114.00	134.00	146.00
325	3 " 170 "	102.00	124.00	140.00	150.00
326	3½ " 200 "	132.00	162.00	184.00	198.00

Radial Center Brass Jacket Drive Well Points.

FIG. 628.

SHOWING THE POINT UNCOVERED.

This cut shows the Radial Center wound with heavy galvanized wire, ready for putting on the Wire Gauze and Brass Jacket.

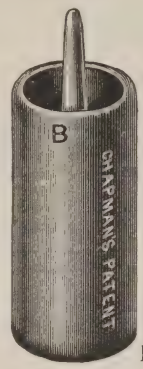
THIS CUT SHOWS FIG. 628 FINISHED.

In these Points there is no possible chance for the Wire Gauze to be clogged up on the under side with clay, or any other substance.

Trade No.		Price per Dozen. No. 60 Gauze.	No. 80 Gauze.	No. 90 Gauze.	No. 100 Gauze.
	1 Inch Points.				
4	2 ft. long, 18 in. Jacket	$ 33.00	$ 40.00	$ 45.00	$ 48.00
8	3 " 30 "	50.00	62.00	72.00	78.00
	1 1-4 Inch Points.				
12	20 in. long, 14 in. Jacket	30.00	36.00	42.00	48.00
16	2 ft. " 18 "	36.00	45.00	52.00	58.00
20	2½ " " 24 "	45.00	56.00	64.00	70.00
	1 1-2 Inch Points.				
28	2 ft. long, 18 in. Jacket	48.00	58.00	66.00	72.00
32	2½ " 24 "	57.00	70.00	80.00	86.00
36	3 " 30 "	66.00	82.00	94.00	102.00
	2 Inch Points.				
40	2 ft. long, 18 in. Jacket	75.00	88.00	98.00	104.00
44	2½ " 24 '	90.00	108.00	115.00	126.00
48	3 " 30 "	102.00	124.00	140.00	150.00

Well Tools and Supplies.

FIG. 860.



Hydraulic Blind Valves. Fig. 860.

To fit 1 in. pipe for 2 in. Wells . .	$2.00
To fit 1¼ in. pipe for 3 in. Wells.	4.00
To fit 2 in. pipe for 4 in. Wells.	8.00

FIG. 860.—Section.

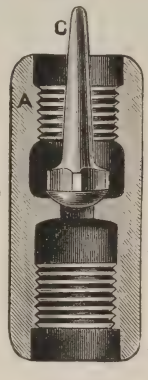


FIG. 861.

Outside Pipe Pullers.—Fig. 861.

No. 2 with 1 inch and 2 inch Dies	$ 4.00
" 3 " 2 " " 3 " "	5.00
" 4 " 4½ " " 6 " "	15.00
" 5 " 6 " " 8 " "	20.00

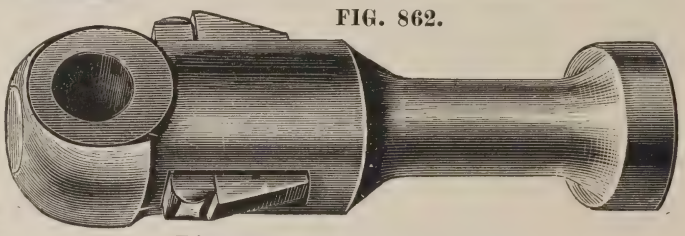
FIG. 863.

Taper Taps.—Fig. 863.

To pull out broken rods.

To pull out 1 inch or 1¼ inch pipe.	$8.00
" " " 2 inch pipe.	8.00

FIG. 862.



Pipe Reamers.—Fig. 862.

For Reaming ends of 2 inch pipe	$3.00
" " " " 2½ " "	4.00
" " " " 3 " "	6.00

FIG. 865.

Drive Heads and Caps.

Size, inches	1¼	1½	2
6 in. long, Wrought-iron, each	$1.50	$2.00	$3.00
6 in. long, Steel, each .	3.50	5.00	8.00

FIG. 864.

Steel Drive Heads.—Fig. 864.

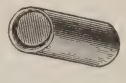
For 1¼ inch pipe, each	$3.00
" 1½ " " "	4.50
" 2 " " "	6.00

FIG. 867.

Drive Shoes.

Size, Inches .	2	2½	3	3½	4
Cast-steel .	$2.50	$3.00	$4.00	$5.00	$7.00
Wrou't Steel	6.00	8.00	10.00	12.00	13.00

FIG. 866.



Pipe Drifts.—Fig. 866.

To clean out inside 2 inch pipe	$2.25
" " " " 2½ " "	3.00
" " " " 3 " "	5.00

Valve Grabs.—Fig. 868.

FIG. 868.

For taking out Check Valves.

2 inch Grab	$2.00
3 " "	3.00
4 " "	4.00

FIG. 884.

Lowering Pipe in Well.

Babcock's Pipe Lifter and Holder.

Price, complete $7.00

Lifting, Holding and Sliding Tongs.

FIG. 869.

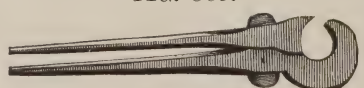
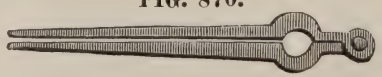


FIG. 870.

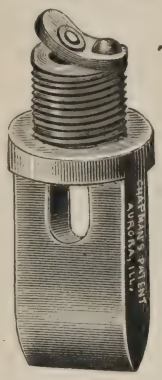


For ¾ inch pipe . . .	$ 6.00
" 1 " " . . .	6.00
" 1¼ " " . . .	7.50
" 1½ " " . . .	8.00
" 2 " " . . .	12.00

Figs. 869, 870, and 884, are used in lifting, holding and lowing Pipe in Wells.

Well Tools and Supplies.

FIG. 871.



Twist and Straight Drills, with Leather Valves.

Figs. 871 and 872.

FIG. 872.

2 in.	2½ in.	3 in.	4½ in.	6 in.
$4.50	$5.50	$6.50	$10.00	$13.00

Without Leather Valves, deduct 50 cents.

FIG. 873.

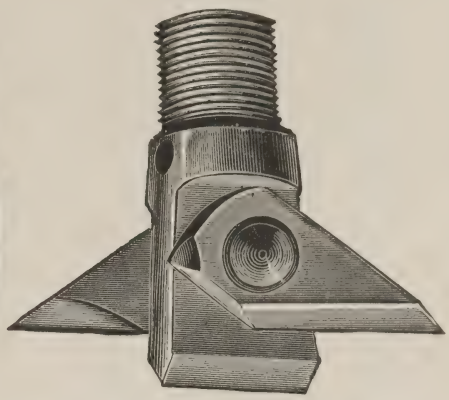


FIG. 874.

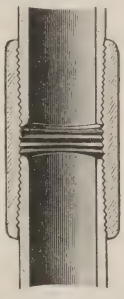
Sand Pump and Drill Combined Fig. 874.

Gas Pipe Thread.	Size of Bit.	Price.
1 inch . . .	1¾ inches	$1.25
1 " . . .	2 "	2.00
1 " . . .	2½ "	4.50
1¼ " . . .	3 "	6.50

Chapman's Patent Paddy Expansion Drill.—Fig. 873.

2 inch Paddy	makes a	4 inch	hole	. . . . .	$5.00
2½ "	"	"	4½ "	"	. . . . .	6.50
3 "	"	"	5 "	"	. . . . .	8.50
4 "	"	"	6½ "	"	. . . . .	11.00

FIG. 875.



Patent Sleeve Tubing Couplings.—Fig. 875.

Size	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price	$.10	.12	.15	.25	.30	.40	.60	.80	1.30	1.50	2.00	2.40	2.80
" Right and Left	.15	.18	.23	.38	.45	.70	1.20	1.60	2.60	3.00	. .	. .	. .

FIG. 876.

FIG. 877.

FIG. 878.

Rock Drills.

Size, inches	2	3	4½	6
Reamer, Fig. 876	$ 6.00	10.00	25.00	35.00
Cross, " 877	7.50	12.00	18.00	30.00
"Z" Shape" 878	12.00	15.00	25.00	35.00

FIG. 879.

FIG. 880.

FIG. 882.

FIG. 883.

Earth Augers.

Size, inches	2	3	4	6
Chisel Bit, } Fig. 879	$6.00	7.00	10.00	25.00
Close Pod " 880	6.00	7.00	10.00	25.00
*Open " " 881	6.00	7.00	10.00	25.00
Ribbon " 882	6.00	7.00	10.00	25.00
Twist " 883	6.00	7.00	10.00	25.00

* Open Pod Auger is not shown by a cut.

Well Tools and Supplies.

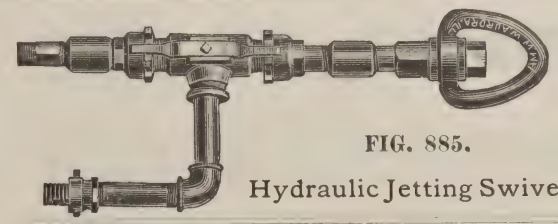


FIG. 885.

Hydraulic Jetting Swivels.

Size in Inches . . .	¾	1	1¼	2	2½	3
Price Complete . .	$15.00	$20.00	$25.00	$40.00	$50.00	$75.00
Water Swivel Only	10.00	16.00	20.00	35.00	43.00	65.00
Rope " "	5.00	5.00	6.00	7.00	8.00	12.00

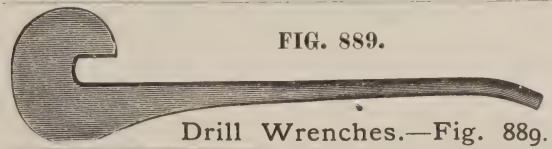
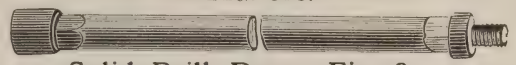


FIG. 889.

Drill Wrenches.—Fig. 889.

For 2½ inch Drilling Tools, each	$10.00
" 3 " " " "	12.00
" Artesian " " " "	15.00

FIG. 893.



Solid Drill Bars.—Fig. 893.

1⅛	inch	diameter,	16	feet	long	. . . . .			$12.00
1⅜	"	"	16	"	"	. . . . .			16.00
2	"	"	10	"	"	. . . . .			30.00
3	"	"	10	"	"	. . . . .			37.00

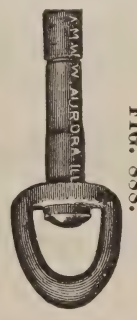


FIG. 888.

Drill Swivels.—Fig. 888.

To Fit 1	inch pipe		$2.00
" " 1	" "	Heavy .	4.00
" " 1¼	" "	"	8.00

FIG. 891.

Pulley Blocks.—Fig. 891.

Single Pulley Block	$ 5.00
Double " "	10.00
Treble " "	15.00

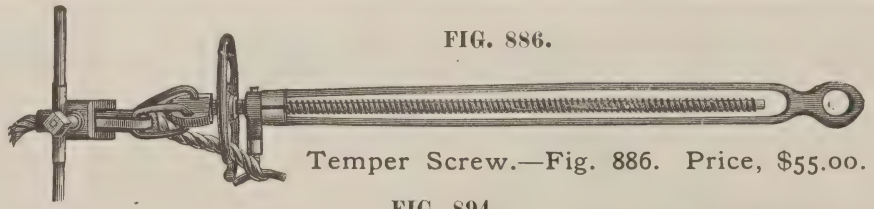
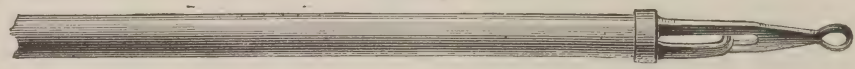


FIG. 886.

Temper Screw.—Fig. 886. Price, $55.00.

FIG. 894.



Sand Pumps.—Fig. 894.

Made of lap-welded tubing, with jar link to prevent sticking in sand; four feet long.

1¾ inch.	2 inch.	2½ inch.	3 inch.
$5.00	$6.00	$6.50	$7.00

FIG. 896.

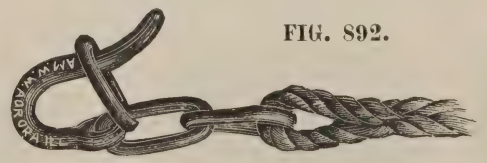
Drill Jars.

LIGHT PATTERN, Fig. 895 (not shown).										ARTESIAN PATTERN.—Fig. 896.								
5	feet	long	for	1	inch	Rod	. . . .	$12.00		Steel	for	3½	inch	Hole	. . . .	$ 75.00
5	"	"	"	2	"	"	. . . .	30.00		"	"	4	"	"	. . . .	90.00
5	"	"	"	2½	"	"	. . . .	35.00		"	"	5½	"	"	. . . .	115.00
5	"	"	"	3	"	"	. . . .	50.00		"	"	6¼	"	"	. . . .	130.00

FIG. 890.

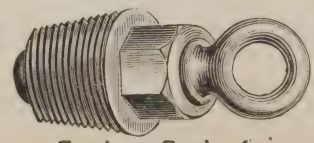
Rope Socket.—Fig. 890. Price, $20.00.

FIG. 892.



Rope Hook.—Fig. 892. Price, $2.00.

FIG. 887.



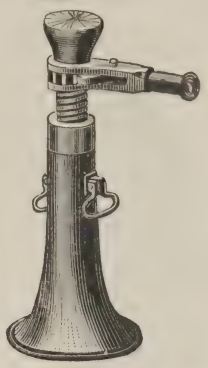
Casing Swivels.

To fit	2	in.	Casing	. .	$ 4.00
" "	2½	"	"	. .	5.00
" "	3	"	"	. .	7.00
" "	4½	"	"	. .	8.50
" "	5	"	"	. .	10.00
" "	6	"	"	. .	12.00

Wrought-Iron Jack Screws.

FIG. 773. WITH CAST-IRON STANDS.

FIG. 774.



Locomotive Jack Screws.—Fig. 773.

Diameter of Screw.	Height of Stand.	Height Over All.	Price.	Diameter of Screw.	Height of Stand.	Height Over All.	Price.
1½ in.	5 in.	8 in.	$3.50	2 in.	22 in.	20½ in.	$12.50
1½ "	6 "	10 "	3.75	2 "	24 "	28½ "	13.50
1½ "	8 "	12 "	4.25	2¼ "	8 "	13 "	7.50
1½ "	10 "	14 "	4.75	2¼ "	10 "	15 "	8.25
1½ "	12 "	16 "	5.25	2¼ "	12 "	17 "	9.00
1½ "	14 "	18 "	6.00	2¼ "	14 "	19 "	10.00
1½ "	16 "	20 "	6.75	2¼ "	16 "	21 "	11.00
1¾ "	6 "	10 "	4.50	2¼ "	18 "	23 "	12.00
1¾ "	8 "	12 "	5.00	2¼ "	20 "	25 "	13.25
1¾ "	10 "	14 "	5.75	2¼ "	22 "	27 "	14.50
1¾ "	12 "	16 "	6.25	2¼ "	24 "	29 "	15.75
1¾ "	14 "	18 "	6.75	2½ "	8 "	14 "	8.75
1¾ "	16 "	20 "	7.50	2½ "	10 "	16 "	9.75
1¾ "	18 "	22 "	8.50	2½ "	12 "	18 "	10.75
2 "	6 "	10½ "	5.25	2½ "	14 "	20 "	12.00
2 "	8 "	12½ "	6.00	2½ "	16 "	22 "	13.25
2 "	10 "	14½ "	6.75	2½ "	18 "	24 "	14.50
2 "	12 "	16½ "	7.50	2½ "	20 "	26 "	15.75
2 "	14 "	18½ "	8.25	2½ "	22 "	28 "	17.00
2 "	16 "	20½ "	9.25	2½ "	24 "	30 "	18.25
2 "	18 "	22½ "	10.25	2½ "	32 "	38 "	26.00
2 "	20 "	24½ "	11.50	3 "	18 "	24 "	25.00

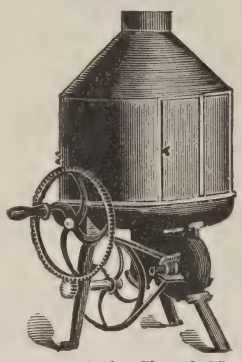
Ratchet Jack Screws.—Fig. 774.

Diameter of Screw.	Height Over All.	Price.	Diameter of Screw.	Height Over All.	Price.	Diameter of Screw.	Height Over All.	Price.
2 in.	18 in.	$25.25	2¼ in.	26 in	$30.50	2½ in.	36 in.	$42.50
2 "	20 "	26.25	2¼ "	28 "	31.75	2½ "	38 "	45.00
2 "	22 "	27.25	2¼ "	30 "	33.00	2¾ "	20 "	41.00
2 "	24 "	28.25	2½ "	18 "	28.00	2¾ "	24 "	45.00
2 "	26 "	29.25	2½ "	20 "	29.25	2¾ "	28 "	48.00
2 "	28 "	30.25	2½ "	22 "	30.50	2¾ "	30 "	50.00
2 "	30 "	31.25	2½ "	24 "	31.75	2¾ "	36 "	58.00
2¼ "	18 "	26.50	2½ "	26 "	33.00	3 "	20 "	43.00
2¼ "	20 "	27.50	2½ "	28 "	34.25	3 "	24 "	47.00
2¼ "	22 "	28.50	2½ "	30 "	35.50	3 "	28 "	50.00
2¼ "	24 "	29.50	2½ "	34 "	40.00	3 "	36 "	61.00

Locomotive Jack Screws have Cast-iron Stands and Wrought-iron Screws. Ratchet Jack Screws have Cast-iron Stands, Wrought Screws, Polished Steel Handles, Ratchet and Pawls.

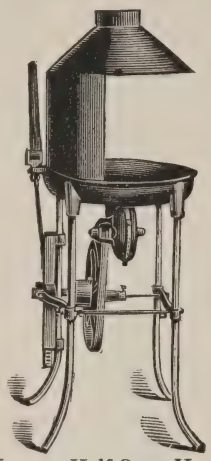
Improved Portable Forges.

FIG. 735.



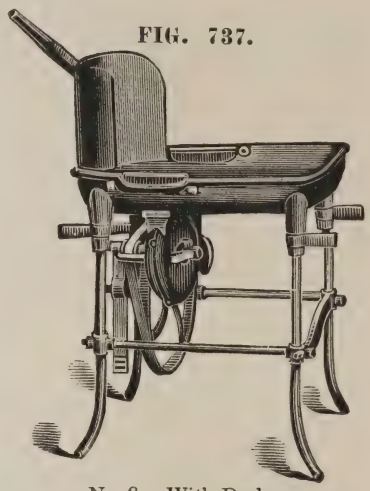
No. 3.—Entirely Closed Hood.

FIG. 736.



No. 4.—Half Open Hood.

FIG. 737.



No. 8.—With Dash.

Fig.	No.	Style of Top.	Size Fan.	Size Hearth.	Height Fire-place.	Weight.	Price.
735	1	With Dash	7 inch.	15x17 in.	15 inches.	45 lbs.	$16.00
735	2	Half Open Hood	7 "	15x17 "	15 "	50 "	18.00
735	3	Entirely Closed Hood	7 "	15x17 "	15 "	55 "	20.00
736	4	Half Open Hood	8 "	21 in. Diam.	34 "	110 "	27.00
736	5	With Dash	8 "	21 " "	34 "	100 "	24 00
736	6	Entirely Closed Hood	8 "	21 " "	34 "	120 "	30.00
737	7	Half Open Hood	10 "	24x30 in.	32 "	200 "	40.00
737	8	With Dash	10 "	24x30 "	32 "	190 "	37.00
737	9	Entirely Closed Hood	10 "	24x30 "	32 "	215 "	42.00

Fig. 735, Nos. 1, 2 and 3, will produce welding heat on 1½ inch Iron in 10 minutes.
" 736, " 4, 5 and 6, " " " " " 2½ " " " 6 "
" 737, " 7, 8 and 9, " " " " " 3 " " " 6 "

FIG. 739.

No. 24.—Power Forge.

Fig. 738.—No. 20, for Hand.

Size of Fan	14 in.
Size of Hearth	30x40 "
Height of Fire-place	30 "
Weight	265 lbs.
Price Without Water Tank	$50.00
Price With Water Tank	54.00

Fig. 739.—No. 24, for Power.

Size of Fan	14 in.
Size of Hearth	30x40 "
Height of Fire-place	30 "
Weight	265 lbs.
Price Without Water Tank	$54.00
Price With Water Tank	58.00
Price With Water Tank, Hand and Power Attachment	62.00
Price With Hand and Power Attachments Without Water Tank	58.00

Nos. 20 and 24 will produce welding heat on 3½ to 4 inch Iron in 10 minutes.

Fig. 738 (no cut shown) is the same as **Fig.** 739, except that the former is for operating by hand.

Dole's Water Tuyere Iron.

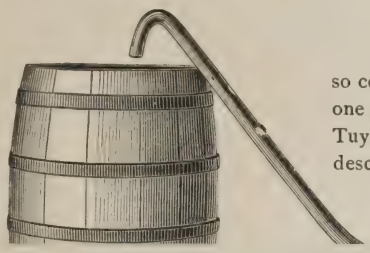


FIG. 728.

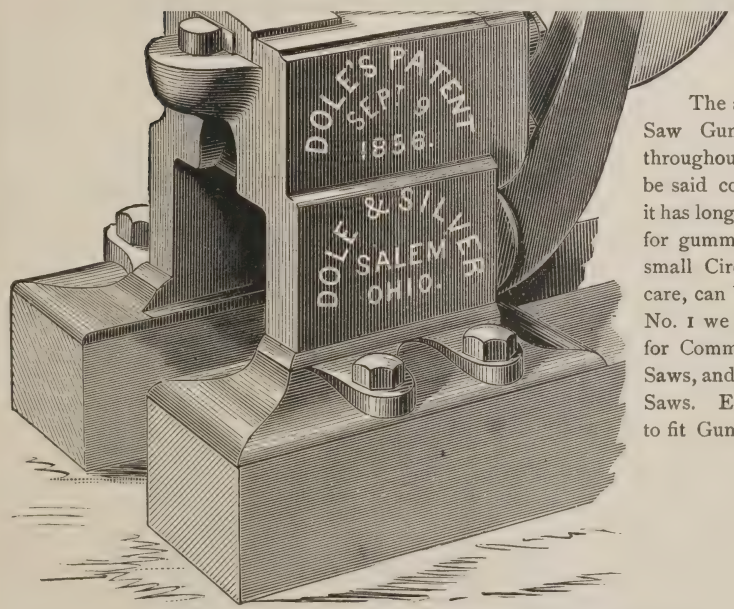
The annexed cut represents Dole's Water Tuyere Iron, **Fig. 728**, which is so constructed as to obviate any difficulty from leakage of joints; being cast in one piece it is simple and not likely to get out of order. This is the most desirable Tuyere Iron in the market, and is too well known by blacksmiths to require any description from us. The cut shows Tuyere with Pipes as it appears ready for use.

Sizes and Prices.

PES.
Price.
3.00

NOTICE!

All articles shown on pages 183 to 204 inclusive (except Fig. 694, on page 191) are now made and sold exclusively by The Silver Manufacturing Company of Salem, O., to whom should be addressed all orders and correspondence relating thereto.



The annexed cut shows our celebrated Press Saw Gummer, which is used so extensively throughout the entire country. Nothing need here be said concerning the merits of this machine, as it has long since become the STANDARD MACHINE for gumming Mill, Mulay, Cross-cut, medium and small Circular Saws, and with skill and proper care, can be used on the largest class of Circulars. No. 1 we recommend for all heavy Saws, No. 2 for Common Mulay, small and medium Circular Saws, and No. 3 for small Circular, and other light Saws. Extra Dies can be furnished at any time to fit Gummers of recent manufacture.

Sizes and Prices.

No.	Adapted For	Weight.	Cipher.	Price.
1	Heavy Mulay Saws	90 lbs.	Lashing	$30.00
2	Medium Circular and Mulay Saws	60 "	Lassitude	25.00
3	Light Circular and other Saws	25 "	Lasting	18.00

Extra dies for Nos. 1 and 2, per set, $5.00; No. 3, per set, $4.00.

SILVER'S
Improved Upright Bench Drill.

WITH ADJUSTABLE TABLE.

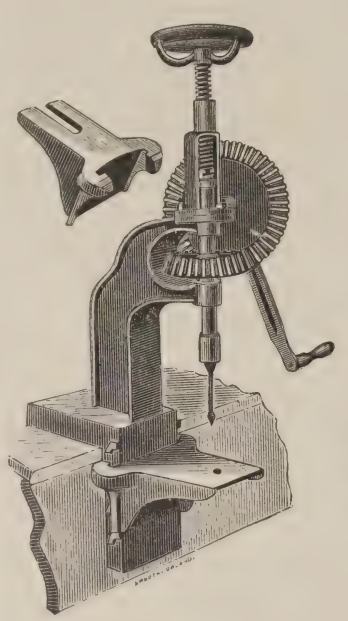


FIG. 726.

The Drill represented by the annexed cut and designated as **Fig. 726,** is Single-geared, without self-feed. It is simple, compact and substantial in construction, and is a desirable machine for those wanting a good Drill at a low price.

Size and Price.

Fig.	Will Drill up to	Weight.	Cipher.	Price.
726	¾ inch.	60 lbs.	Languish	$12.00

IMPROVED
Self-Feeding Blacksmith Drill.

WITH SLIDING TABLE.

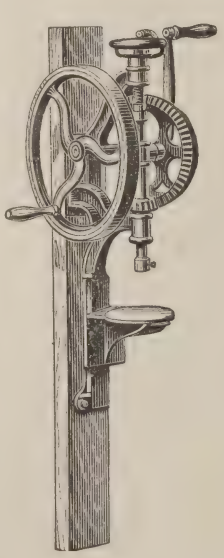


FIG. 720.—No. 1.

The annexed cut represents the smallest size of our Improved Upright Self-feeding Blacksmith Drills; the larger size being represented by cuts on the following pages. The Self-feed is very simple, and the table can be readily adjusted to any desired height.

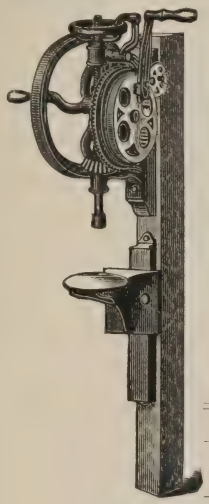
Size and Price.

Fig.	No.	Style Table.	Will Drill up to	Weight.	Cipher.	Price.
720	1	Sliding	¾ inch.	80 lbs.	Languor	$20.00

Price list of Twist Drills on page 186.

IMPROVED
Self-Feeding Blacksmith Drills.

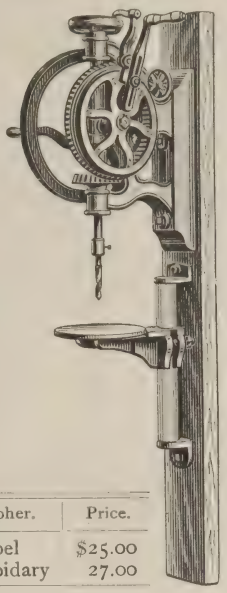
FIG. 721.—Sliding Table.



Number 2.

The two Drills illustrated herewith are the same in size, capacity and weight; the only difference being that one is provided with a Sliding Table, and the other with a Swinging Table. The No. 2 is the size Drill we sell most of; they are heavy enough for ordinary carriage and wagon work.

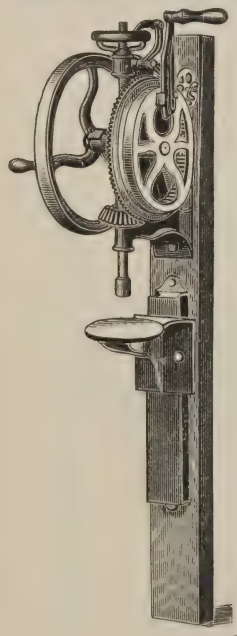
FIG. 722.—Swinging Table.



Sizes and Prices.

Fig.	No.	Style of Table.	Will Drill up to	Weight.	Cipher.	Price.
721	2	Sliding	1 inch.	100 lbs.	Lapel	$25.00
722	2	Swinging	1 "	100 "	Lapidary	27.00

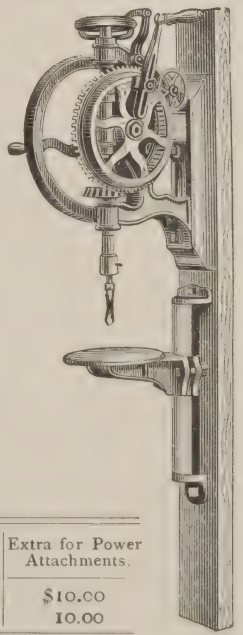
FIG. 723.—Sliding Table.



Number 3.

The No. 3 Drills illustrated by the annexed cuts are preferred by many to No. 2 Drills on account of their greater weight and strength. They are the same in general construction as the No. 2 Drills shown above.

FIG. 724.—Swinging Table.



Sizes and Prices.

Fig.	No.	Style Table.	Will Drill up to	Weight.	Cipher.	Price.	Extra for Power Attachments.
723	3	Sliding	1¼ inch.	160 lbs.	Lapsed	$38.00	$10.00
724	3	Swinging	1¼ "	160 "	Larboard	40.00	10.00

Price list of Twist Drills on page 186.

IMPROVED
Self-Feeding Blacksmith Drill.

WITH SWINGING TABLE.

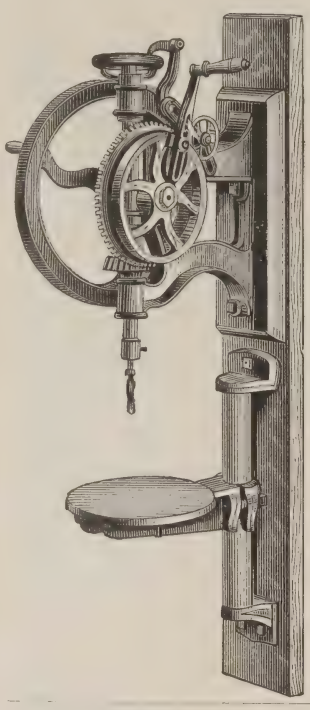


FIG. 725.—No. 4.

The annexed cut illustrates our largest size Self-feeding Drill, No. 4, with Swinging Table. We do not make this size Drill with Sliding Table. The attachments for power for both the No. 3 and 4 Drills include Cone Pulleys, Counter Shaft and Cone Belt.

Size and Price.

Fig.	No.	Style Table.	Will Drill up to	Weight.	Cipher.	Price.	Extra for Power Attachments.
725	4	Swinging	1½ inch.	225 lbs.	Larceny	$60.00	$10.00

Price List of Twist Drills.

Diameter of Drill, inches.	To Fit the Nos. 1 and 2, and Upright Bench Drill.			To Fit the Nos. 3 and 4 Drills.		
	Diameter Shank.	Length.	Price.	Diameter Shank.	Length.	Price.
1/8	1/2 inch.	6 inches.	$0.50	11/64 inch.	6 inches.	$0.55
3/16	"	"	.55	"	"	.60
1/4	"	"	.60	"	"	.70
5/16	"	"	.70	"	"	.75
3/8	"	"	.75	"	"	.85
7/16	"	"	.80	"	"	.90
1/2	"	"	.85	"	"	.95
9/16	"	"	.90	"	"	1.00
5/8	"	"	1.05	"	"	1.05
11/16	"	"	1.15	"	"	1.15
3/4	"	"	1.25	"	"	1.25
13/16	"	"	1.35	"	"	1.35
7/8	"	"	1.45	"	"	1.45
15/16	"	"	1.60	"	"	1.60
1	"	"	1.80	"	"	1.80
1 1/16	. . . . .	. . . . .	. . . . .	"	"	2.00
1 1/8	. . . . .	. . . . .	. . . . .	"	"	2.20
1 3/16	. . . . .	. . . . .	. . . . .	"	"	2.30
1 1/4	. . . . .	. . . . .	. . . . .	"	"	2.40

Twist Drills are extra, and are not included in prices of machines.

Silver's Hub-Boxing Machine.

WITH OPEN ADJUSTABLE FEED NUT.

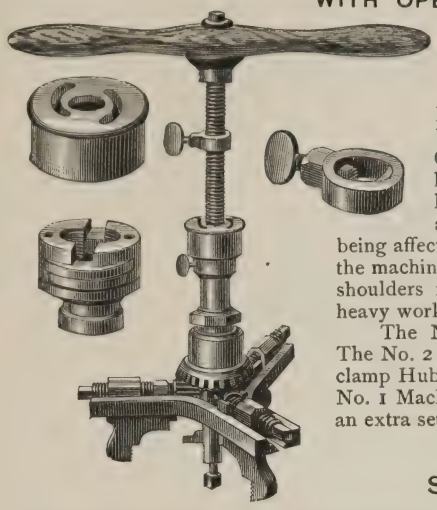


FIG. 710.

This machine is of more recent construction than the Dole Hub-Boxing Machine, and combines all the good qualities of that popular Machine, besides having some features not possessed by it. The Open Feed Nut, which admits of withdrawing the Mandrel from the hub, after boring the required depth, by simply turning the cap to the left, is an important consideration. The peculiar form of the Chuck admits of a better view of the work, while the movement of the jaws, being affected by the aid of screw pinions working directly through the Jaws, gives the machine great power for clamping the hub. The Jaws are provided with two shoulders for clamping hubs—the inner ones for light, and the outer ones for heavy work.

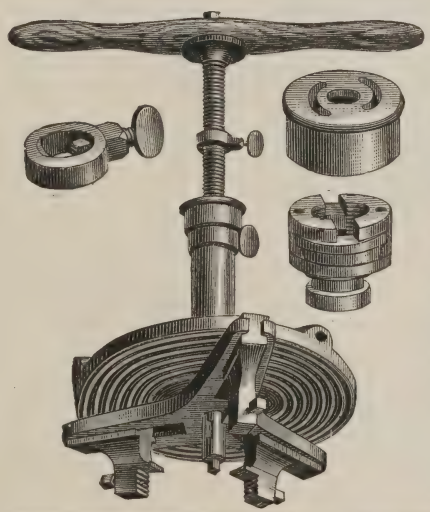
The No. 1 Machine will clamp Hubs from 2 to 9½ inches in diameter. The No. 2 Machine, which is designed to be used only on very heavy work, will clamp Hubs from 9 to 14½ inches in diameter. When ordered, we furnish the No. 1 Machine with an extra Mandrel, made light at the end, and provided with an extra set of small Bits, which renders it suitable for the lightest class of work.

Sizes and Prices.

No.	Will Clamp Hubs	MACHINE COMPLETE.		EXTRA MANDREL AND BITS.	
		Cipher.	Price.	Cipher.	Price.
1	2 to 9½ inches diameter.	Labial	$25.00	Labyrinth	$3.00
2	9 "14½ " "	Labored	35.00	. . . . .	. . . . .

Extra Bits, per set: for No. 1, 75 cents; for No. 2, $1.00.

Dole's Hub-Boxing Machines.



FIGS. 711 and 712.

This cut represents **Fig. 711**, Dole's Old Standard Hub-boxing Machine, with Silver's Patent Open Adjustable Feed Nut. It is still made with the Solid Feed Nut, (**Fig. 712,**) but with the Open Feed Nut it is regarded as more desirable, as it admits of the Mandrel being drawn from the Hub with one motion, instead of screwing it back. The No. 1 Machine is suitable for Buggy and Carriage work, and will grasp hubs from 2 to 6 inches in diameter. The No. 2 Machine is suitable for Buggy, Carriage and Wagon work, and will grasp hubs from 2 to 12 inches in diameter. The No. 3 Machine is suitable for the heaviest class of Wagon work, and will grasp hubs from 2½ to 15 inches in diameter. When ordered, we furnish the Nos. 1 and 2 with an extra Mandrel made light at the end, with an extra set of small Bits, which makes them suitable for the lightest class of work. **Fig. 712** is same as **Fig. 711** with Solid Feed Nut instead of Open Feed Nut.

Sizes and Prices.

No.	Will Clamp Hubs	FIG. 711—OPEN FEED NUT.		FIG. 712—SOLID FEED NUT.	
		Cipher.	Price.	Cipher.	Price.
1	2 to 6 inches diameter.	Laced	$20.00	Laconic	$16.00
2	2 " 12 " "	Lacerate	23.00	Lacteal	19.00
3	2½ " 15 " "	Lackey	27.00	Ladder	22.00

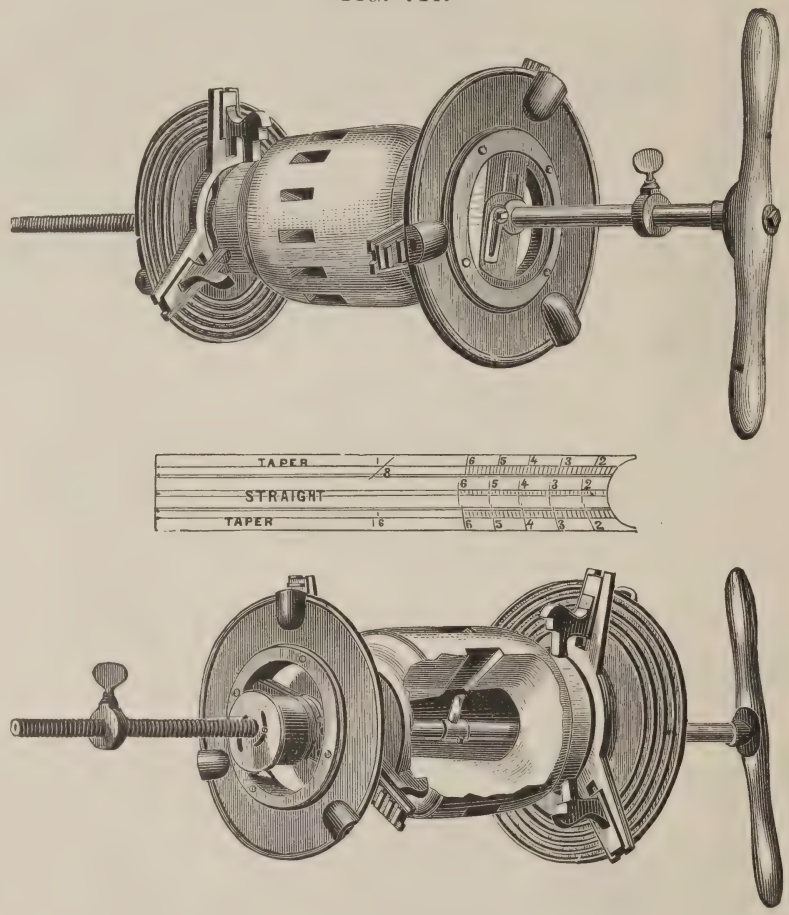
Extra Mandrel and Bits for No. 1 or No. 2, $3.00.
Extra Bits for Nos. 1, 2 and 3: 60 cents, 75 cents and 85 cents respectively.

Silver's Hub-Boxing Machine.

WITH DOUBLE CHUCK.

FOR BORING STRAIGHT OR TAPER HOLE.

FIG. 714.



The machine represented above has been perfected since the Dole and the Silver Machines. It was placed on the market to meet a demand from manufacturers of Wagons and Heavy Trucks, for a machine that could be so adjusted as to cut either a straight hole or one of any desired taper.

The upper engraving shows a front view of the Chuck attached to the large end of the Hub, showing the device for varying the taper of the hole; and the lower cut gives a reverse view of the machine showing the Mandrel and Bit in position for boring a taper hole. The Silver's Patent Open Feed Nut, with an adjustable socket, is used, allowing the Mandrel always to operate according to the taper of the hole. The adjustable rule enables the operator to set the bits for cutting either a straight or taper hole, as may be desired.

Size and Price.

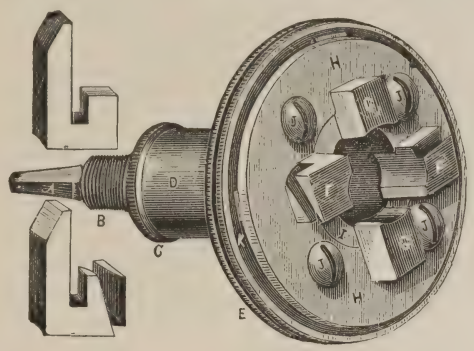
Fig. 714.	Large Chuck will Clamp	Small Chuck will Clamp	Cipher.	Price.
Complete.	6 to 12 inches in Diameter.	3 to 9 inches in Diameter.	Ladle	$35.00

Extra Bits per set, 75 cents.

The "Star" Hollow Auger.

FIG. 715.

The annexed cut represents our new Star Hollow Auger, **Fig. 715.** It is an improvement on the Dole Hollow Auger, which was manufactured by us for many years previous to the invention of the Star Auger. It combines all the valuable qualities of the Dole Auger, as well as some novel and desirable features of its own; and we confidently recommend it as the best Hollow Auger made. The Bits are provided with two cutting edges, arranged at right angles with each other, one cutting the shoulder while the other pares off the surface of the tenon, leaving it a model of mechanical neatness. The Auger in the engraving is shown with an Adjustable Shank, which adapts it to use in an ordinary Brace. This Shank also serves to regulate the length of the tenon. The form of the Bits and Blanks is also shown in the engraving. We manufacture three sizes of this Auger as listed below.



Sizes and Prices.

No.	Adapted to Cutting Tenon.	Cipher.	* Price.
1	$\frac{7}{16}$ to 1 inch in Diameter.	Lagoon	$ 6.00
2	$\frac{5}{8}$ to 1¼ " "	Laity	13.00
3	¾ to 1½ " "	Lameness	15.00

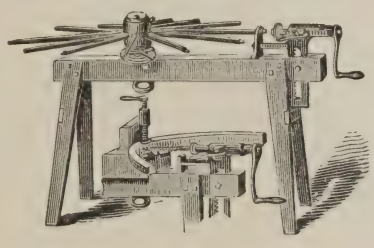
* No. 1 with Adjustable Shank, $7.00. Prices of extra Bits and Blanks in list of repairs on last pages of this Catalogue.

Spoke Tenoning Machine.

FIG. 716.—No. 1.

The cut below represents our No. 1 Spoke Tenoning Machine, which is adapted to hand use. It is fitted with our No. 1 Star Hollow Auger, and will cut tenons any size from $\frac{7}{16}$ to 1 inch. The Hub is held in a Self-centering Chuck, which can be revolved to present the spokes to the Hollow Auger; the spokes being held firmly on the rest, and in line with the Auger. Thus all the tenons are cut with the shoulders uniform in width and in the same plane. With a slight transformation it can be changed into a Boring Machine, for boring the Felloes for the spokes, giving that accuracy in the work that can be alone attained by machinery. The Felloe Boring arrangement is shown in the cut below the Tenoning Machine.

Bit Chucks with ½ inch round hole always furnished with the Felloe Boring attachment, unless otherwise ordered. When so ordered we furnish them with square-hole Chucks, so that the ordinary Brace Bits can be used in the Machine. For description of an important improvement in our Tenoning Machines, see the next page.



Sizes and Prices.

No.	With Felloe Boring Attachment.		Without Felloe Boring Attachment.	
	Cipher.	Price.	Cipher.	Price.
1	Lament	$23.00	Lampoon	$18.00

Boring Bits are extra, at prices given below, and are not included in the price of the Tenoning Machines.

Price List of Cook's Patent Machine Bits.

Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.	Size, Inch.	Price, Each.
¼	$0.45	$\frac{7}{16}$	$0.70	$\frac{5}{8}$	$1.00	$\frac{13}{16}$	$1.30	1	$1.65	$1\frac{3}{16}$	$2.30	$1\frac{3}{8}$	$2.50		
$\frac{5}{16}$	.50	½	.80	$\frac{11}{16}$	1.05	⅞	1.45	$1\frac{1}{16}$	1.80	1¼	2.35	$1\frac{7}{16}$	2.60		
⅜	.60	$\frac{9}{16}$	.90	¾	1.15	$\frac{15}{16}$	1.50	1⅛	1.85	$1\frac{5}{16}$	2.40	1½	2.65		

Cook's Machine Bits fit all sizes of our Tenoning and Felloe Boring Machines.

Spoke Tenoning Machines.

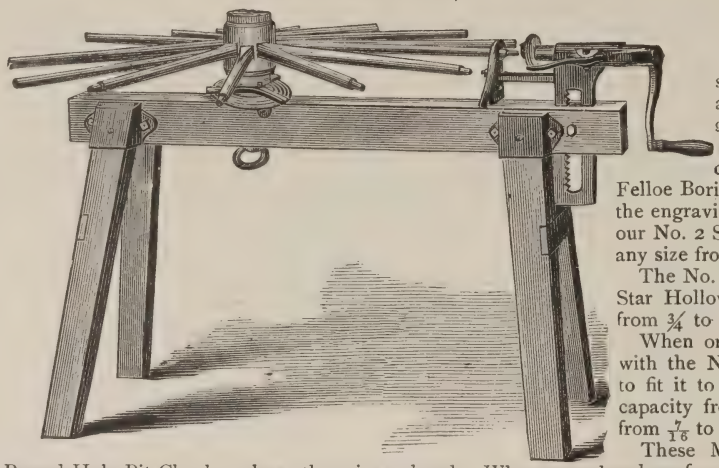


FIG. 717.—Nos. 2 and 2½.

The annexed cut represents our large size Hand Tenoning Machines, Nos. 2 and 2½. They are made on the same general plan as the No. 1 Machine, and re provided with legs, as shown in the cut. They are also furnished with the Felloe Boring Attachment, which is not shown in the engraving. The No. 2 Machine is fitted with our No. 2 Star Hollow Auger, and will cut tenons any size from ⅝ to 1¼ inch.

The No. 2½ Machine is fitted with our No. 3 Star Hollow Auger, and will cut tenons any size from ¾ to 1½ inch.

When ordered we fit both of these Machines with the No. 1 Star Hollow Auger and Reducer to fit it to the shaft, which gives the No. 2 a capacity from $\frac{7}{16}$ to 1¼ inch, and the No. 2½ from $\frac{7}{16}$ to 1½ inch.

These Machines are always furnished with a Round Hole Bit Chuck, unless otherwise ordered. When so ordered we furnish them with Square Hole Chucks, so that the ordinary Brace Bits can be used. For description of an i nportant improvement in our Tenoning Machines, see cut and description below. See prices at bottom of the page.

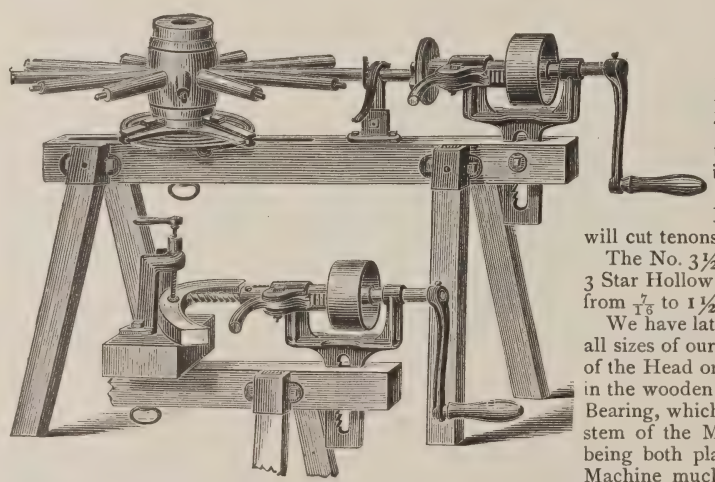


FIG. 718.—Nos. 3 and 3½.

This cut exhibits our Improved **Hand and Power Spoke Tenoning Machine,** of which we make two sizes. They are intended to supply a demand from large factories for a Power Tenoning Machine.

The No. 3 Machine is fitted with our Nos. 1 and 2 Star Hollow Augers, and will cut tenons any size from $\frac{7}{16}$ to 1¼ inch.

The No. 3½ Machine is fitted with our Nos. 1 and 3 Star Hollow Augers, and will cut tenons any size from $\frac{7}{16}$ to 1½ inch.

We have lately made an important improvement in all sizes of our Spoke Tenoning Machines. Instead of the Head or Main Casting being held in a mortise in the wooden Frame, it is provided with a cast-iron Bearing, which is bolted to the wooden Frame. The stem of the Main Casting and the slot in the Bearing being both planed and fitted accurately, makes the Machine much more durable and easier to adjust. This improvement is not shown in the cuts of the Tenoning Machines.

The Nos. 3 and 3½ Machines are provided with Felloe Boring Attachment same as the other sizes. Always furnished with Round Hole Bit Chuck, unless a Square Hole Chuck is ordered.

Sizes and Prices.

Fig.	No.	Adapted For	With Felloe Boring Attachment.		Without Felloe Boring Attachment.	
			Cipher.	Price.	Cipher.	Price.
717	2	Hand use.	Lamprey	$32.00	Landlady	$25 00
717	2½	" "	Lancet	35.00	Landlord	28.00
718	3	Hand or Power.	Landau	45.00	Landscape	38.00
718	3½	" "	Landgrave	50.00	Language	43.00

Above Machines without No. 1 Auger and Reducer, $8.00 less list. Prices of Boring Bits, page 189.

IMPROVED
Ham Preserving Pump.

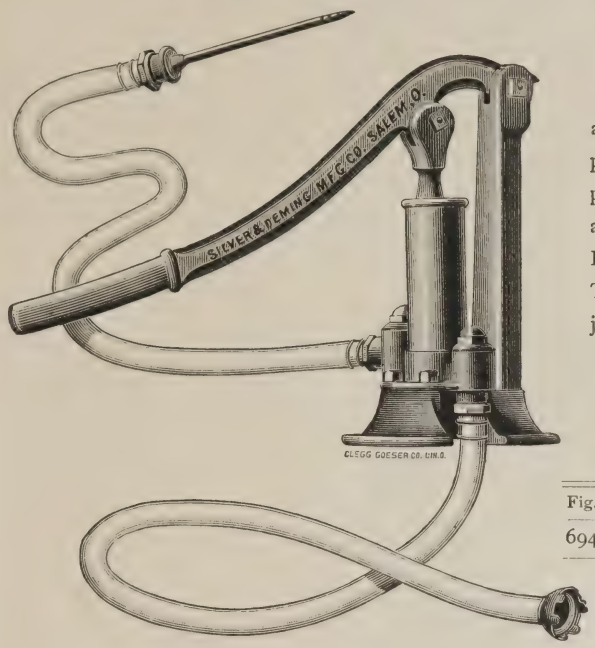


FIG. 694.

The Pump represented by the annexed cut is adapted for Curing Hams by means of forcing a pickle or liquid preparation into them. This pickle permeates every part of the ham, and will cure it in a very short time, in any season of the year. This Pump is compact and powerful in its operation. The working parts are made of Brass, and the Injecting Needle Point is nickel-plated.

Size and Price.

Fig.	Suction Hose.	Discharge Hose.	Weight.	Cipher.	Price.
694	3 ft. of ½ inch.	3 ft. of ½ inch.	34 lbs.	Major	15.00

IMPROVED
Steam Jacket Lard Kettle.
FOR RENDERING LARD.

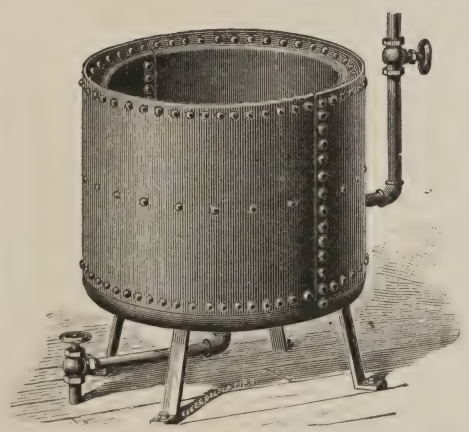


FIG. 795.

The Steam Jacket Lard Kettle, represented by the cut annexed, is of superior quality, being made entirely of Plate Steel, which is more durable than Iron. This Kettle rests on an Iron Frame, eighteen inches high, and has a blow-off cock; also a lard cock (1½ inch valve) on bottom for drawing off the lard, and a three quarter inch steam valve to connect with the boiler.

Sizes and Prices.

No.	Diameter.	Depth.	Capacity.	Cipher.	Price.
1	30 inches.	24 inches.	75 Gallons.	Majority	$ 85.00
2	36 "	28 "	100 "	Malachite	110.00
3	38 "	30 "	150 "	Malady	135.00
4	40 "	32 "	175 "	Malaga	160.00
5	42 "	33 "	200 "	Malaria	185.00

Larger sizes of Steam Jacket Lard Kettles made to order.

Improved Lard Press.

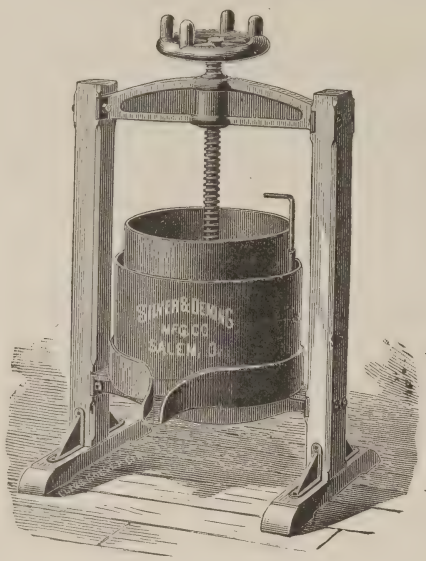


FIG. 762.

This cut represents our new Lard Press, **Fig. 762,** with Wooden Frame, made in three sizes. The Cylinder and Strainer are made heavy and the Curb high, so that the hot lard will not spurt over the rim. The inside Cylinder is tinned, and all other parts are constructed of the best material, making them strong and substantial throughout.

Sizes and Prices.

No.	Diameter of Cylinder.	Height of Cylinder.	Capacity.	Cipher.	Price.
1	12 inches.	10 inches.	4.9 gallons.	Malayan	$10.00
2	14 "	12 "	8. "	Malcontent	17.50
3	16½ "	17 "	16.7 "	Malice	28.00

"HERCULES"
Lard and Tallow Press.

WITH COMPOUND LEVER.

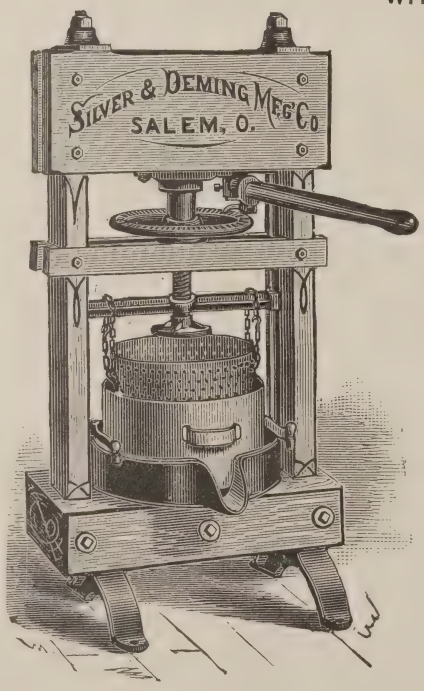


FIG. 767.

The annexed cut represents an improved Lard and Tallow Press, which we are manufacturing. With this Press one man can obtain a pressure of thirty tons. It is well made and convenient, and will be found adapted to the wants of butchers doing an extensive business. This Press may be operated, when not under pressure, by the Hand Wheel direct. For applying pressure, or releasing it from the same, a Compound Lever is provided. To extract the cake, connect the Chains to the Cross-bar, run the Screw up until the Adjustable Bearings will pass under the Ring near the lower end of the Cylinder, when it can readily be forced out with the screw. This is the *most powerful* Hand Lard Press manufactured.

Size and Price.

Fig.	Diameter of Cylinder.	Height of Cylinder.	Capacity.	Cipher.	Price.
767	16½ inches.	18 inches.	18 gallons.	Malignant	$80.00

IMPROVED

Mandioca and Cider Press.

WITH DOUBLE RATCHET LEVER.

FIG. 766.

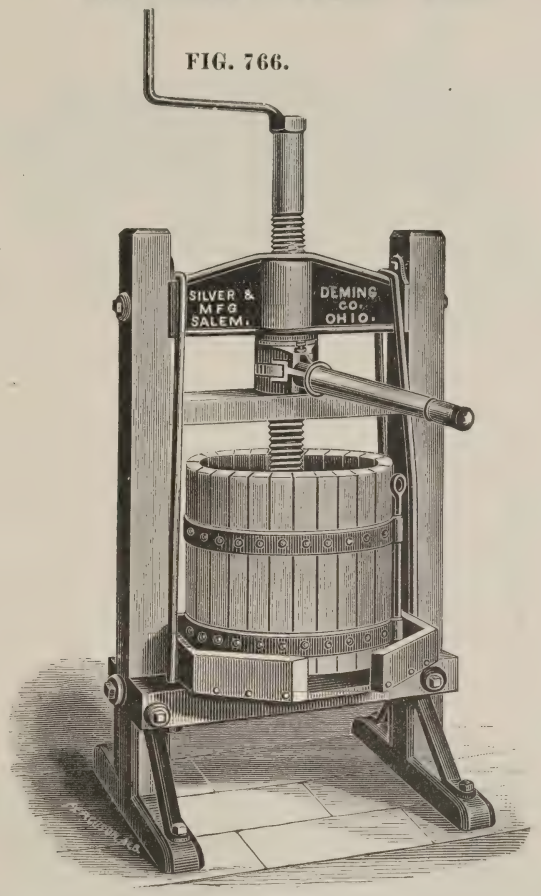


Fig. 766 represents our Improved Mandioca and Cider Press. All parts of this Press are made very strong and heavy, and it will be found well adapted to the wants of cider producers, and for any purpose where the pulp and juice of any fruit or vegetables are to be separated. It is provided with a Lever about three feet long, and a double Ratchet, so that it will work both ways. The Screw is of wrought-iron, and has a Handle on top for running it back quickly after pressing. By withdrawing the long pin shown at the right of the Cage, the sides of the Cage may be opened or taken off, and the pomice more readily removed than by the old method. With a slight change it can be arranged for pressing Lard and Tallow.

Sizes and Prices.

No.	Diameter of Cage.	Height of Cage.	Diameter of Screw.	Height of Press.	Cipher.	Price.
3	10 inch.	17 inch.	2 inch.	60 inch.	Mallard	$ 38.00
4	12 "	17 "	2½ "	60 "	Maltese	40.00
5	16 "	17 "	3 "	60 "	Mammon	50 00
6	21 "	17 "	3¼ "	60 "	Manacle	75.00
*7	28 "	20 "	3½ "	66 "	Mandarin	125.00
*8	36 "	24 "	4 "	72 "	Mandate	190.00

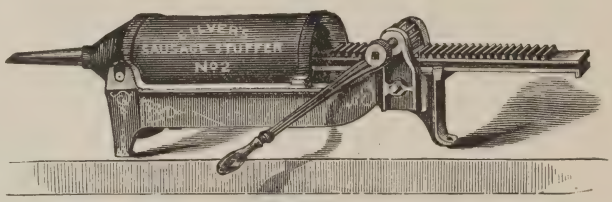
*Nos. 7 and 8 are provided with two Levers.

Silver's Improved Sausage Stuffer.

SINGLE GEARED.

WITH TINNED STEEL BARREL.

FIG. 757.



The above cut represents our Single Geared Sausage Stuffer, Fig. 757, which we make in two sizes, Nos. 1 and 2, adapted for the use of farmers, hotel keepers, and butchers doing a small business. The barrels are all made of tinned steel.

Sizes and Prices.

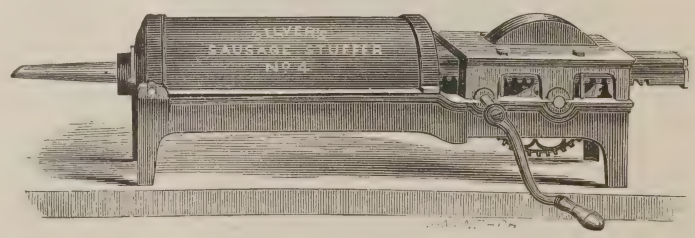
Fig.	No.	Capacity.	Weight Crated.	Cipher.	Price.
757	1	6 lbs.	30 lbs.	Macaroni	$5.00
757	2	9 "	40 "	Machinate	8.00

Silver's Patent Sausage Stuffer.

DOUBLE GEARED.

WITH TINNED STEEL BARREL.

FIG. 758.



This cut represents Silver's Sausage Stuffer, Nos. 3 and 4. All the gearing being encased, the operator is not subjected to the annoyance of having his clothing soiled or caught. The Crank Shaft is provided with a Pinion, which by a slight pressure inward on the Crank is brought in line with the Driving or large wheel, giving the required power and slow motion for stuffing. When the Crank Shaft is drawn out the Pinion comes in line with the Rack Bar, reversing the motion of the Piston, throwing it out rapidly, without changing or reversing the motion of the Crank. The Piston-head is provided with a self-acting Valve, which serves to admit air instantly on its being reversed, removing the difficulty incident to withdrawing the Piston with an air pressure behind it, and a vacuum in its front. The Barrels are all Tinned Steel, which makes them both durable and handsome in appearance.

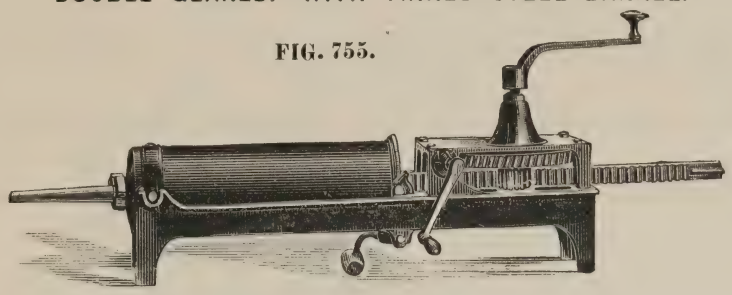
Sizes and Prices.

Fig.	No.	Capacity.	Weight Crated.	Cipher.	Price.
758	3	12 lbs.	60 lbs.	Mackerel	$14.00
758	4	20 "	75 "	Madame	18.00

The "Pioneer" Sausage Stuffer.

DOUBLE GEARED. WITH TINNED STEEL BARREL.

FIG. 755.



The "Pioneer" Sausage Stuffer, represented by the above cut, has been on the market for many years. It is substantially constructed on the most approved plan, and is well adapted to the wants of Butchers doing a good business. This machine is powerfully geared; has a quick return motion for drawing the Piston back after Stuffing a Cylinder full of Sausage. It is arranged to fasten the Cylinder firmly to the frame while in use.

The Cylinders or Barrels are made of *Tinned Plate Steel*, securely riveted, making them handsome in appearance as well as substantial in construction.

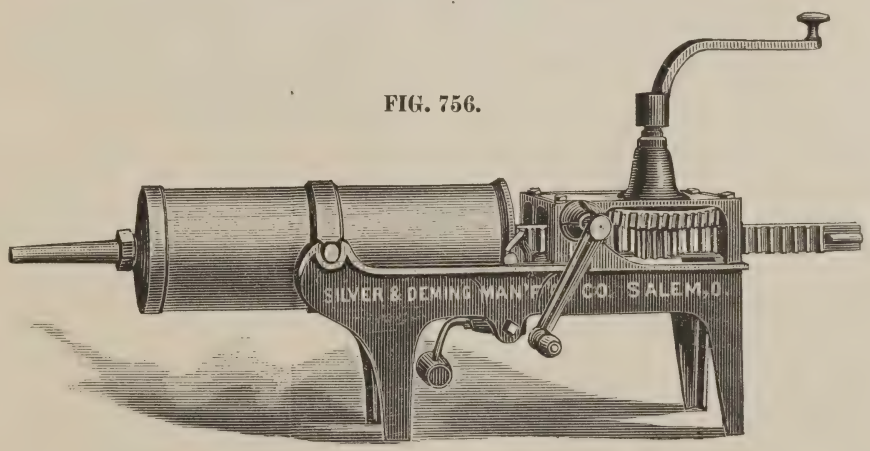
Sizes and Prices.

Fig.	No.	Capacity.	Weight Crated.	Cipher.	Price.
755	5	10 lbs.	60 lbs.	Madeira	$ 9.00
755	6	12 "	90 "	Madonna	14.00
755	7	18 "	100 "	Madrigal	18.00

The "Pioneer" Sausage Stuffer.

DOUBLE GEARED. WITH TINNED STEEL BARREL.

FIG. 756.



The above cut represents No. 8, our largest size Stuffer, designated as **Fig. 756**. It is substantially the same in construction as Nos. 6 and 7; but the axis of the Cylinder is in the center instead of at the end as in Nos. 6 and 7. Like the preceding numbers the Cylinder or Barrel is of *Tinned Steel*. This is an important improvement. This machine is adapted to the wants of butchers doing a large business.

Size and Price.

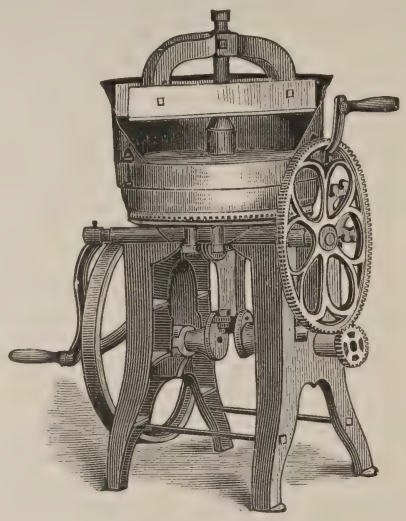
Fig.	No.	Capacity.	Weight Crated.	Cipher.	Price.
756	8	38 lbs.	175 lbs.	Magazine	$30.00

SILVER'S

Improved Hand Meat Chopper.

WITH TWO CRANKS AND INTERMITTENT FEED.

FIG. 751.



Silver's Improved Meat Chopper, represented above, is too well known to need a lengthy description. These machines are made entirely of iron except the Block. The Knives are made of the best steel. The working parts are substantially constructed and are all under the Block; thus insuring perfect cleanliness. The Knives cut the meat thoroughly, and the feed is intermittent, never striking the Block when it is in motion.

Nos. 4 and 5 are fitted with two cranks so that they may be run by one or two persons as desired. They are also arranged so that a pulley may be attached for running them by power. On account of their solidity and strength they make very satisfactory Power Choppers for those who do not need a machine of large capacity.

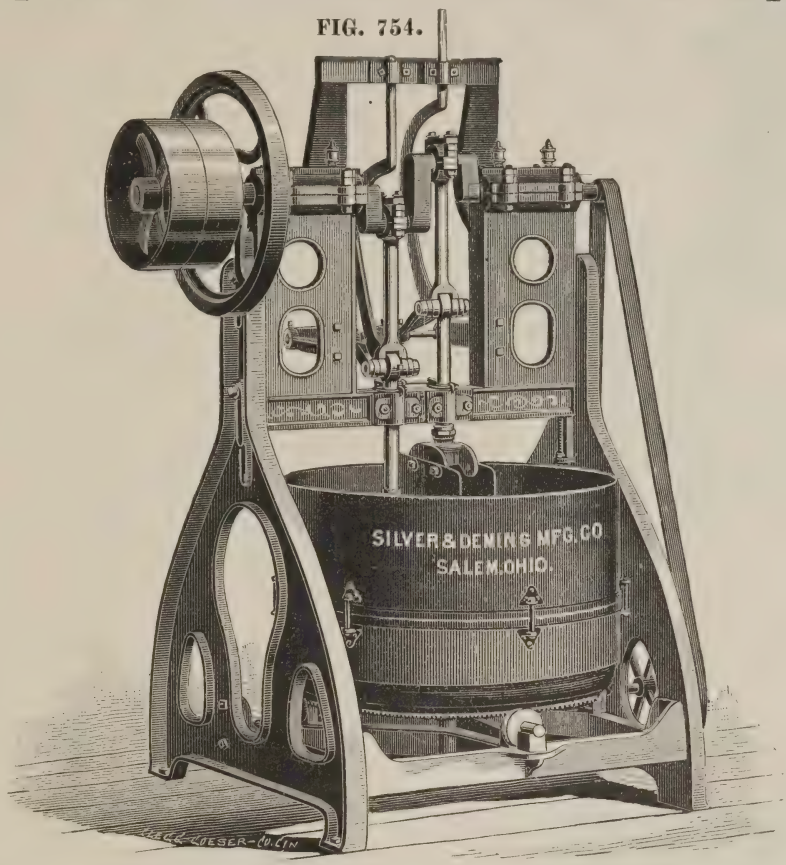
Sizes and Prices.

No.	Diameter of Block.	Capacity.	Weight.	Cipher.	Price.
2	16 inches.	10 to 12 lbs.	300 lbs.	Magic	$50.00
3	18 "	12 to 15 "	350 "	Magical	55.00
4	20 "	15 to 20 "	400 "	Magistrate	65.00
5	22 "	20 to 25 "	460 "	Magnesia	70.00

Pulleys for Nos. 4 and 5 Chopper for running by power, $2.00 extra list.

THE IMPROVED
"Duplex" Power Meat Chopper.

FIG. 754.



Our "Duplex" Power Meat Chopper, represented by the above cut, has been made with special reference to fast cutting, strength and durability. The Frame and all the working parts have been made strong and substantial. The Crank Shafts and Pitmans are forged from the best *refined wrought-iron*, and the knives are made of the best hammered steel. The bearings of the Crank Shaft are provided with four Self-feeding Glass Oil Cups, as shown in the engraving. The Blocks are made of thoroughly seasoned, selected hardwood maple lumber, and are the best that can be made. Each machine has two sets of Knives which strike the block alternately. The Knives are easily and quickly adjusted and can be removed without trouble. They are adjustable on the upright Shaft so that they can be lowered as the block wears away. The Center Frame is also adjustable and it is held in position by heavy bolts and two large set screws as shown in the cut. The blocks are very thick, and will last a long time before they need be replaced. The Caps are bolted to the Journal boxes by ⅝ inch bolts, made of best refined iron, which are provided with lock nuts to prevent any possibility of their working loose. The Fly-wheels are heavy and are turned and balanced. Each machine has tight and loose Pulley which are also turned off. In fact this machine is constructed on correct mechanical principles, and will be found superior to any Meat Chopper made, and we can confidently recommend it to butchers wanting a first-class machine.

For Engines to run these Choppers, see next page. The two-horse Engines are adapted to run the No. 16 Chopper, and the four-horse Engines are adapted to run the No. 17 Chopper. The band wheels on the Engines are right size to run the Choppers the proper speed, which is about 400 revolutions per minute.

Sizes and Prices.

No.	Diameter of Block.	Stroke.	Capacity.	* Size of Pulleys.	Weight.	Cipher.	Price.
16	28 inches.	6 inch.	60 to 70 lbs.	15x4 inches.	1000 lbs.	Magnetic	$150.00
17	34 "	6 "	100 " 110 "	15x4 "	1400 "	Magnetism	200.00

* Other sizes of Pulleys furnished when ordered.

Vertical Engine and Boiler.

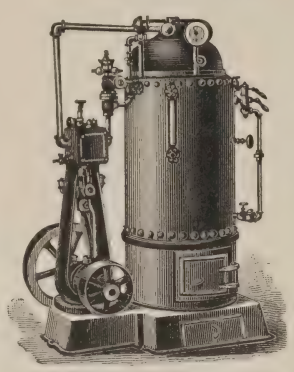


FIG. 794.

The annexed cut represents the Vertical "Standard" Portable Engine, which we make in three sizes, with variations in the size of Boiler. The Crank Shafts and Connecting Rods, or Pitmans, Piston-rods and Valve Stems are made of Steel.

These Engines are complete, as shown in cut, with Governor, Injector, Safety Valve, Steam Gauge, Glass Water Gauge, Compression Gauge Cocks, Blow-off Valve, Steam Chest Oiler, Cast-iron Bonnet for Smoke Stack, etc. The Boiler Heads and Shells are made of Plate Steel, and every Boiler is thoroughly tested before shipping.

These Engines are particularly adapted for running our "Duplex" Meat Chopper, **Fig. 754**, on preceding page.

On two and four horse-power Engines, the Fly-wheel is used as Belt-wheel, and on the six horse-power Engines the belt runs from Pulley. The Fly-wheel is twenty-four inches in diameter.

Sizes and Prices.

No.	Horse Power. Engine.	Horse Power. Boiler.	Dimensions of Cylinder	Style of Fire Box.	Dimensions of Boiler.	Boiler Flues. Number.	Boiler Flues. Dimensions.	Size of Pulley.	Revolutions per Minute.	Shipping Weight.	Price.
2	2	2	3¼ x 5	Cast-iron	20 x 60	19	2 x 36	16 x 8	250 to 350	900	$175.00
2A	2	4	3¼ x 5	"	24 x 67	21	2¼ x 41	16 x 8	"	1000	245.00
4	4	4	4½ x 5	"	24 x 67	21	2½ x 41	16 x 8	"	1100	290.00
4A	4	6	4½ x 5	"	24 x 72	50	2 x 50	16 x 8	"	1850	315.00
4B	4	6	4½ x 5	Wrought Steel	26 x 60	37	2 x 36	16 x 8	"	1750	350.00
4C	4	8	4½ x 5	"	30 x 60	43	2 x 38	16 x 8	"	1900	375.00
6	6	6	5½ x 6	Cast-iron	24 x 72	50	2 x 50	16 x 8	175 to 300	2175	350.00
6A	6	6	5½ x 6	Wrought Steel	26 x 60	37	2 x 36	16 x 8	"	2075	400.00
6B	6	8	5½ x 6	"	30 x 60	43	2 x 38	16 x 8	"	2350	435.00
6C	6	12	5½ x 6	"	36 x 72	55	2 x 48	16 x 8	"	2700	480.00

Horizontal Engine and Boiler.

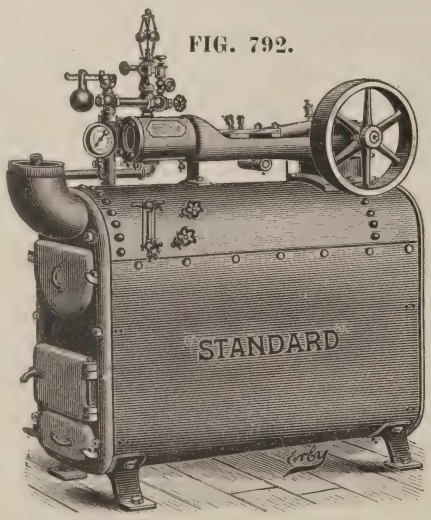


FIG. 792.

These Engines are made with reference to durability and ease of operation; the Fire Box is so constructed as to adapt it for coal, wood, natural gas or petroleum. This advantage is attained by the Return Flues, through which the fire returns to the Smoke Stack after passing to the rear in the Fire Box, thus giving a maximum of heating surface, by which means steam can be more easily generated and retained than with other styles of Boilers, and in addition to this, the flues are rendered very durable on account of being covered with water, and are therefore less liable to unequal expansion and contraction.

The Boilers are made of the best plate steel, hand-riveted, and the Engines are constructed with a view to withstanding any service to which a Semi-Portable Engine may be subjected. The Steam Cylinders are large, thus giving really greater power than is indicated in the table below. These Engines are fitted with Governor and all necessary Oilers, and the Boilers have Water Gauge, Steam Gauge, Safety Valve, Gauge Cocks and Injector. All parts, being made with special tools, are interchangeable, and repairs will always fit. These Engines are adapted for running our Ensilage and Feed Cutters, on pages 202 and 203.

The Pulleys are heavy, and together with the large Counterbalances on the Crank Shaft, take the place of a Separate Fly-wheel, giving all possible *smoothness* and *regularity of motion* to the Engine.

Sizes and Prices.

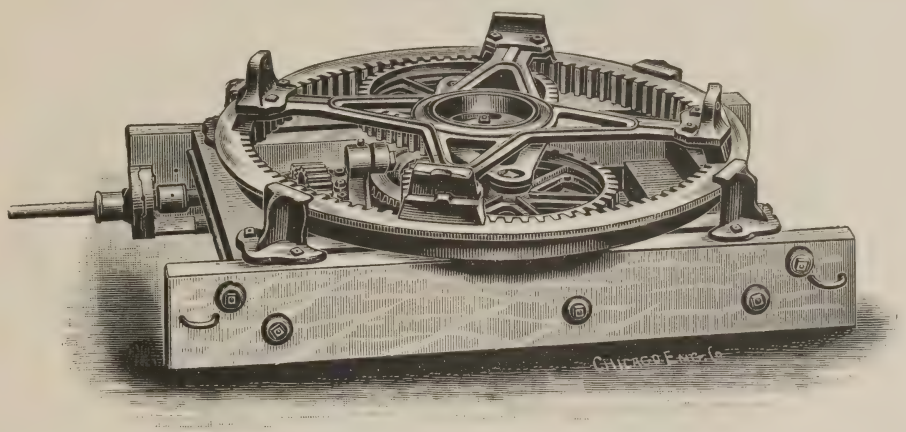
No.	Horse Power. Engine.	Horse Power. Boiler.	Dimensions of Cylinder.	Dimensions of Boiler.	Boiler Flues. Number.	Boiler Flues. Dimensions.	Size of Pulley.	Revolutions per Minute.	Shipping Weight.	Price.
2	2	2	3½ x 5	18 x 50	11	2¼ x 40	14 x 4	300	1000	$175.00
2A	2	4	3½ x 5	22 x 65	16	2¼ x 55	14 x 4	300	1600	225 00
4	4	4	4½ x 6	22 x 65	16	2¼ x 55	20 x 4	250	1900	275.00
4A	4	6	4½ x 6	26 x 76	19	2½ x 66	20 x 4	250	2400	325.00
6	6	6	5½ x 8	26 x 76	19	2½ x 66	26 x 5	200	2800	375.00

IMPROVED

Double-Geared Horse Power.

WITH INTERNAL FACED MASTER WHEEL.

FIG. 702.



The above cut represents our Improved Horse Power for operating Feed Cutters, Feed Mills, Corn Shellers, Wood Saws, Meat Choppers, and our largest Pumps when attached to Pumping Jack, **Fig. 701**, on page 161. We designate this style of Horse Power as **Fig. 702**, and we make two sizes, viz: for two horses and four horses respectively. The cut shows the Four-horse Power.

The **Master-wheel** of this style of Horse Power is internal faced, with Vertical Gears. Every part of these machines is constructed in the best possible manner, with a view to durability and ease of operation.

In addition to the purposes for which these machines may be used, as enumerated above, they are adapted or running **Well Drilling Outfits**.

The utility of these machines cannot be over-estimated, where steam power is not available, or is too expensive.

The Four-horse Power has two speeds, one just twice that of the other, as given in table below. When greater speed is required, the "Power Jacks," **Figs. 703** and **704** may be used.

Sizes and Prices.

No.	Size.	Furnished With	* Tumbl'g Rod Revolves to one Revolution of Master Wheel	Weight.	Cipher.	Price.
2	2 Horse Power	2 Levers, 2 Lead Bars, 2 Tumbling Rods, 1 Ground Block, 3 Knuckle, etc.	28 times.	600 lbs.	Nervous	$50.00
4	4 Horse Power	2 Double Levers, 2 Lead Bars, 1 Tumbling Rod, 1 Ground Block, and a 22-inch Pulley.	28 and 56 times.	800 lbs.	Neutral	70.00

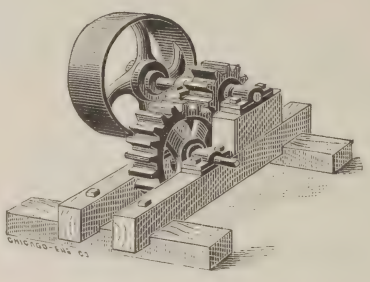
* The Speed of Master Wheel, *i. e.* speed or number of revolutions the horses will make in a minute, is about three, which would give the Tumbling Rod of the two-horse Power about eighty-five revolutions per minute, and the four-horse Power the same speed; and also (with the fast motion) double that speed, or about 170 revolutions per minute.

IMPROVED

Geared Horse-Power Jacks.

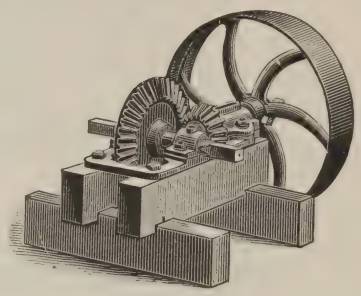
FOR TRANSMITTING POWER BY BELT.

FIG. 703.



Spur Gear Jack.

FIG. 704.



Bevel Gear Jack.

The above cuts represent our Horse-power Jacks for increasing speed and transmitting power by belt. The Spur Gear Jack, **Fig. 703**, transmits the motion at a right angle with the Tumbling Rod; and the Bevel Gear Jack, **Fig. 704**, transmits the motion in a line with the Tumbling Rod. We make two sizes of each style of these Horse-power attachments, and the speed transmitted varies to suit different purposes for which they may be used. They are provided with fifteen-inch Pulleys, but when ordered we can furnish them with Pulleys up to twenty-four inches in diameter. When horses are walking at ordinary speed, the Pulley of Jack for Two-horse Power will make 191 revolutions per minute, and the Four-horse Power Jacks will make 233 revolutions per minute; and with the fast speed the Four-horse Power will make double the speed, or 382 and 466 revolutions per minute, with the Two-horse and Four-horse Jacks respectively.

Our Horse-powers, when used with these Jacks, are well adapted for running the "Ohio" Standard Feed Cutters, described and listed on page 202.

Rules for Computing Speed of Pulleys will be found on page 9.

Sizes and Prices.

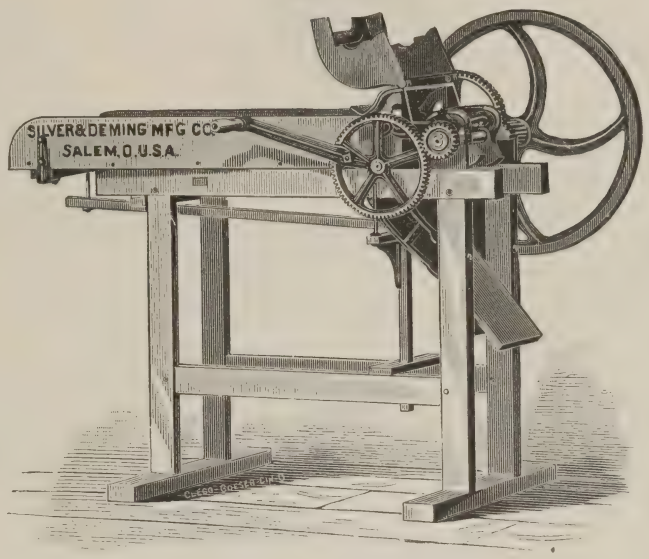
No.	Adapted for	*Pulley Revolves to 1 Revolution of Tumbling Rod	Fig. 703—Spur Gear Jack.		Fig. 704—Bevel Gear Jack.	
			Cipher.	Price.	Cipher.	Price.
2	2 Horse Power	2¼ times	Netting	$10.00	Niece	$10.00
4	4 " "	2¾ "	Newel	18.00	Niter	18.00

*Pulleys furnished with these Jacks are 15 inches in diameter; larger sizes, up to 24 inch, furnished when ordered.

The "Ohio" Hand Feed Cutter.

CHANGE OF CUT MADE WITHOUT EXTRA PINIONS.

FIG. 782.



The above cut represents our new "Ohio" Hand Feed Cutter, which we have recently placed on the market to supply a long-felt want for a Hand Cutter that could be sold at a *moderate price*, and combine the qualities of *lightness and strength*, *ease of operation*, *convenience* and *simplicity of construction*. We have succeeded in producing such a machine, and we confidently recommend these Cutters to the trade, as the *best Hand Feed Cutters* manufactured.

These Cutters are substantially constructed throughout; they are made in three sizes, with 7, 8½, and 10½ inch knives respectively, and are designated by numbers indicating the length of knife. The Nos. 8½ and 10½ have three lengths of cut, and are furnished with either one or two knives; but always with one knife, unless otherwise specified. The No. 7 always has one knife and one length of cut, and is a very *handy machine* for the use of those feeding one or two head of stock.

Sizes and Prices.

No.	Length of Knives.	No. of Knives.	Lengths of Cut.	Cipher.	Price.
7	7 inches.	1 Knife	¾ inch.	Narcotic	$18.00
8½	8½ "	1 Knife	½, ¾, 1½ "	Narrative	22.00
8½	8½ "	2 Knives	¼, ⅜, ¾ "	Nation	25.00
10½	10½ "	1 Knife	½, ¾, 1½ "	Nativity	27.00
10½	10½ "	2 Knives	¼, ⅜, ¾ "	Natural	30.00

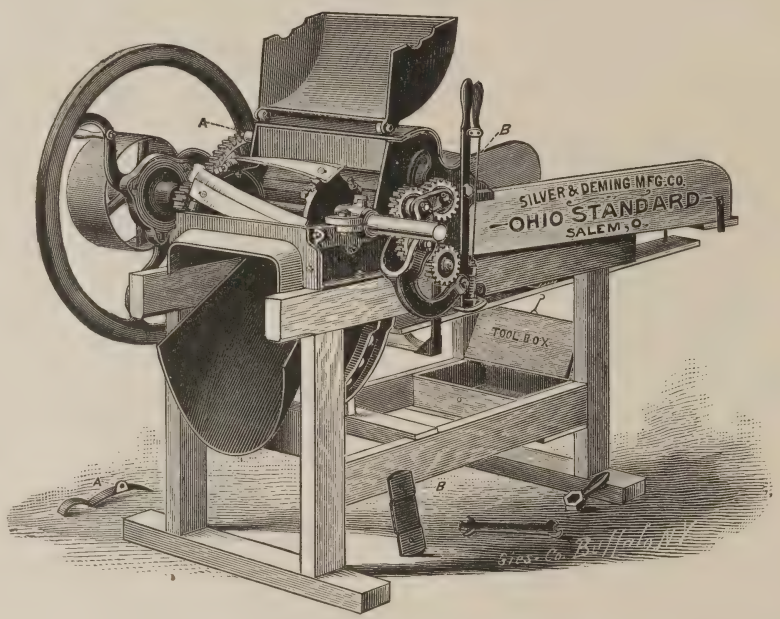
The No. 7 machine is always furnished with one knife and one length of cut. The Nos. 8½ and 10½ always have three lengths of cut and are always furnished with one knife, unless ordered with two knives.

Special illustrated catalogue and circular of Ensilage and Feed Cutters furnished on application.

The "Ohio" Standard Feed Cutter.

WITH PATENT SAFETY FLY-WHEEL, ADJUSTABLE KNIFE-HEAD AND STOP-FEED LEVER.

FIG. 784.



Our Standard Feed Cutters have been long known as the best "general purpose" Power Cutters manufactured. We have recently added several new features for convenience in operating these machines. Nos. 11, 13, 16 and 18 have a **Lever to stop Feed Rollers,** and change length of cut; and all sizes have a new **Adjusting Device** for the Upper Feed Roller; and a solid **Adjustable Knife-Head,** whereby the knives may be easily and accurately adjusted to the **Cutter Bar.** New patterns have been made for all of these Cutters, all parts being constructed with a view to durability. These Cutters have *less gearing* and are *more easily controlled* by the operator than any machine of the kind manufactured.

Our **Patent Safety Fly-wheel** is the most perfect thing of the kind ever invented. Used in connection with our Power Feed Cutter, it insures safety to the machine and operator.

We have recently added to our line of the Standard Feed Cutters a new size, No. 18 (with four knives, eighteen inches long), which is well adapted for cutting Ensilage as well as Dry Corn Fodder. We have discontinued the manufacture of our No. 20 Standard Cutter, and have produced a No. 20 of the Ohio Special Ensilage Cutter, described and listed on next page. Description and price list of Carriers for Power Cutters will be found on page 204.

The Nos. 9, 11 and 13 Cutters are furnished with either two or four knives, but always with *two knives,* unless ordered with four knives. The Nos. 16 and 18 Cutters are always furnished with *four knives,* but can be arranged as two-knife machines by detaching two alternate knives. Nos. 9 and 11 may be used by hand or power; larger sizes are adapted for power.

Sizes and Prices.

No.	Knives.	Fly-wheel.	Pulley.	Weight.	WITH TWO KNIVES.			WITH FOUR KNIVES.		
					Lengths of Cut.	Cipher.	Price.	Lengths of Cut.	Cipher.	Price.
9	9 in.	Common	. . .	340 lbs.	½, 1, 1½, 2 in.	Nauseous	$32.00	. . . . .	. . . . .	. . .
9	9 "	Safety	12 x 4	350 "	½, 1, 1½, 2 "	Navigate	35.00	¼, ½, ¾, 1 in.	Needless	$40.00
11	11 "	"	12 x 4	400 "	½, 1, 1½, 2 "	Necrology	40.00	¼, ½, ¾, 1 "	Negative	45.00
13	13 "	"	12 x 6	520 "	½, 1, 1½, 2 "	Nectar	55.00	¼, ½, ¾, 1 "	Neglect	65.00
16	16 "	"	12 x 6	600 "	. . . . .	. . . . .	. . .	¼, ½, ¾, 1 "	Negligent	90.00
18	18 "	"	12 x 6	700 "	. . . . .	. . . . .	. . .	¼, ½, ¾, 1 "	Neighbor	120.00

Pulley for No. 9, with Common Fly-wheel $2.50, extra list. Power Cutters should run from 300 to 500 revolutions per minute. Pulleys six, eight, ten or fifteen inches in diameter furnished with these machines when ordered.

Special Catalogue of Ensilage and Feed Cutters with Treatise on Silos and Ensilage furnished on application.

The "Ohio" Special Ensilage Cutter.

WITH PATENT SAFETY FLY-WHEEL, ADJUSTABLE KNIFE-HEAD,

STOP-FEED LEVER, TIGHT AND LOOSE PULLEYS.

FIG. 786.

The above cut represents our "**Ohio**" **Special Ensilage Cutter,** with right delivery **Angle Carrier.** This Cutter has given the best of satisfaction during the four years it has been on the market, and we have this year greatly improved it, increasing the capacity about twenty-five per cent, strengthening all parts and adding several new features for the convenience of the operator. We have also brought out another size with twenty-inch knives, which, on account of its substantial construction and a maximum opening of throat, has a capacity equal to that of the No. 24 machine as formerly made.

We shall hereafter designate these machines as the "Ohio" Special Ensilage Cutters, **Fig. 786,** Nos. 20 and 24.

Both of these Cutters are provided with a Lever for stopping the operation of the Feed Rollers. Our patent Safety Fly-wheel is a complete protection against accidents. When run to the full capacity, No. 20 will cut from ten to fifteen tons, and No. 24 from fifteen to twenty tons of green corn fodder per hour. These machines are the *most powerful*, the *most durable*, the *most convenient*, and *in every way* the *best* ENSILAGE CUTTERS on the market. *We challenge the* WORLD to produce their equal. These Cutters should be run from 300 to 500 revolutions per minute.

Sizes and Prices.

No.	4 Knives.	4 Lengths Cut.	Pulleys.	Weight.	Power.	Cipher.	* Price.
20	20 inches long.	¼, ½, ¾ and 1 inch.	18x6 inches.	1200	6 H. P.	Nephew	$170.00
24	24 " "	¼, ½, ¾ " 1 "	18x6 "	1400	8 H. P.	Neptune	225.00

* Prices given above do not include Carrier. See next page for description and price list of Reversible Carrier.
Our special Catalogue and Treatise on Silos and Ensilage furnished on application.

DESCRIPTION
OF
Reversible Carriers or Elevators.

FOR ENSILAGE AND FEED CUTTERS.

When ordered, we furnish Carriers for the Nos. 11, 13, 16 and 18 Ohio Standard Feed Cutters, and the "Ohio" Special Ensilage Cutters Nos. 20 and 24.

The Silo built above ground has, by experts in this line of Agriculture, been demonstrated as the best; with a Silo built in this manner a Carrier is always necessary. Carriers for all sizes of our Cutters are made in every case *reversible, i. e.*, any Carrier ordered and shipped as a "Straight Delivery Carrier," can be changed in a few minutes to either right or left delivery Angle Carrier, or *vice versa*. The motion of our Carriers is positive; the Angle Carrier, fifteen feet long, and under, is driven by means of sprocket wheels and chain belt, geared from a shaft of the Cutter to a counter-shaft below, thence by bevel gearing to the driving shaft at the bottom of the Carrier. The latter shaft has two sprocket wheels, one on either side of the Carrier, over which runs the link chain belt; to this are attached the elevating slats. At the upper end of Carrier is another set of sprocket wheels, over which the elevating chain moves; an adjusting device is placed here, by means of which the slack in chain can be taken up at will. The Straight Delivery Carriers, fifteen feet long and under, are driven in a similar manner, dispensing with one shaft and the bevel gearing; these articles, however, are furnished with every Carrier. Carriers longer than fifteen feet are driven from the top to prevent the chain slackening in the Carrier trough. The upper Carrier Shaft is made long enough so that a Pulley for driving can be attached thereto. The driving power is transmitted by belt from Pulley on Knife Shaft, or from a line shaft.

Price List of Reversible Carriers.

Number.	Adapted for	Regular Sizes and Prices.		Extra over 12 ft. long.
		Length.	Price.	Price per foot.
11	No. 11 Cutter.	12 feet or less.	$30.00	$1.50
13	" 13 "	"	30.00	1.50
16	" 16 "	"	33.00	1.75
18	" 18 "	"	30.00	1.75
20	" 20 "	"	40.00	2.00
24	" 24 "	"	40.00	2.00

Directions for Ordering Carriers.

Great care should always be taken in ordering Carriers to specify with an accompanying sketch, the position and space to be occupied by Cutter, position of Engine, size and position of Silo and opening in same, with height of opening above a level of where the Cutter is to stand; also the horizontal distance from the Cutter to the Silo. Having these data we can easily calculate the length of Carrier, and determine the best method of driving the same. Carriers should not be placed at an angle with the floor of more than forty-five degrees, as above that the material is liable to drop back from the elevating slats. Carriers can be used to advantage in cutting dry fodder, hay, straw, etc., the material being elevated and stored away as fast as cut. In cutting green fodder for Ensilage, Carriers are almost a necessity, and their sale is increasing rapidly; a large proportion of Power Cutters being now ordered with Carrier.

Our Special Catalogue and Treatise on Silos and Ensilage furnished on application.

PRICE LIST

OF

Repairs or Extra Parts.

The lists given on this and the following pages comprise repairs for the various Pumps we manufacture; also are added Repair Lists of Feed Cutters, Carriage Makers' Tools and other goods of our make.

All articles of our manufacture are made to exact gauges and templets, so that in ordering repairs our customers need *have no fear* that the new parts will not fit. When in doubt as to the name given the repair, it will not be amiss to make a sketch and give dimensions or weight, if the Figure and Number, or size of the article, are not known. We take the utmost pains in the construction of all our goods. They are made strong and durable so that with ordinary usage breakages will seldom occur.

PUMP REPAIRS.

Levers or Handles.

Cistern Pumps, Figs. 117, 118, 119, 120, 121, 122 123 and 124.	
Nos. 0, 1 and 2	$ 0.50
No. 3	.60
No. 4	.70
No. 5	1.00
No. 6	1.25
Pitcher Spout Pumps, Figs. 125, 126, 129 and 130.	
Nos. 1 and 2	.50
Nos. 3 and 4	.60
No. 5	.75
Molasses Pumps, Fig. 140.	
Nos. 4, 5 and 6	1.00
No. 7	1.50
No. 8	2.00
Open Top Well Pumps, Figs. 200, 225 and 201.	
Nos. 1, 2 and 3	.75
Nos. 4, 5 and 6	.85
Open Top Well Pumps, Figs. 204, 205, 207, 208, 210, 211, 212 and 216.	1.00
Tight Top Well Pumps, Figs. 202, 203 and 206.	
Nos. 2 and 3	.90
Nos. 4, 5 and 6	1.00
Tight Top Well Pumps, Figs. 209, 213, 214, 215 and 217	1.00
Well Pump Standards, Figs. 224 and 228	1.00
Well Force Pumps, Figs. 219, 220, 221, 223, 226, 250 and 251	1.25
Well Force Pump Standard, Figs. 229 and 239	1.25
Special Well Pump Standard, Fig. 227	1.50
Deep Well Pump Standards, Figs. 230 and 231	$1.75
Heavy Deep Well Pump Standards, Figs. 232 and 233	2.00
Well Pumps with Wind-mill Top, Figs. 420, 421 and 423	1.50
Well Force Pumps, with Wind-mill Top, Figs. 422 and 442	1.50
Deep Well Standards with Wind-mill Top, Figs. 426 and 427.	
With 6 inch Stroke	1.75
With 10 inch Stroke	2.00
Wind Mill Pumps, 6 inch Stroke, Figs. 397, 399, 400, 401, 403, 404, 405, 406, 407, 408, 409, 410, 411, 413, 414, 415, 416, 417, 418, 428, 430, 431, 480 and 481	1.50
Wind Mill Pumps, 10 inch Stroke, Figs. 400, 401, 403, 404, 405, 406, 407, 410, 411, 413, 415, 416, 417, 418 and 428	1.75
Wind Mill Pumps, Adjustable Stroke, Figs. 402, 405, 410 and 419	2.00
Hand Force Pumps, Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 530, 531, 534 and 535 all sizes	1.00
House Force Pumps, Single and Double-acting, Figs. 520, 521, 522, 524, 541 and 542, all sizes	2.00
"New York" Brass Force Pump, Figs. 556, 557, 558 and 559	.75
Hand Boiler Feed Pump, Fig. 587	1.00

Fulcrums or Bearers.

Cistern Pumps, Figs. 117, 118, 119, 120, 121, 122 and 123.

Nos. 0, 1 and 2	$ 0.70
No. 3	.75
No. 4	.80
No. 5	1.00
No. 6	1.10

Pitcher Spout Pumps, Figs. 125, 126, 129 and 130.

Nos. 1 and 2	.40
Nos. 3 and 4	.50
No. 5	.60

Molasses Pump, Fig. 140.

Nos. 4, 5 and 6	.75
No. 7	1.50
No. 8	2.00

Well Pumps, Figs. 200, 201 and 225.

Nos. 1 and 2	.70
Nos. 3 and 4	.80
Nos. 5 and 6	.90

Well Pumps, Figs. 204, 205, 207, 208 and 216	.75
Well Pumps, Fig. 210	.90
Well Pumps, Fig. 211	1.00
Well Pumps, Fig. 212	1.10

Tight Top Well Pumps, Figs. 202, 203 and 209.

Nos. 2 and 3	1.25
Nos. 4, 5 and 6	1.50

Tight Top Well Pumps, Fig. 213	1.00
Tight Top Well Pumps, Fig. 214	1.25
Tight Top Well Pumps, Fig. 215	1.50
Well Force Pumps, Figs. 219, 220, 221, 222, 223 and 226	1.25
"Peerless" Double-acting Force Pumps, Figs. 250 and 251	1.50

Well Pump Standards, Fig. 224.

No. 3	$ 0.90
No. 4	1.00
No. 5	1.10

Tight Top Well Pump Standard, Fig. 228.

No. 3	1.00
No. 4	1.25
No. 5	1.50

Well Force Pump Standards, Figs. 229 and 239	1.25
Deep Well Pump Standards, Figs. 232 and 233	3.00
Wind Mill Pumps, 6 inch Stroke, Figs. 397, 399, 400, 401, 403, 420, 421 and 423	1.50
Wind Mill Pumps, 10 inch Stroke, Figs, 400, 401 and 403	2.00
Wind Mill Pumps, Adjustable Stroke, Figs. 402 and 419	2.50
Wind Mill Force Pumps, 6 inch Stroke, Figs. 404, 405, 406, 407, 410, 411, 413, 415, 416, 417, 418, 422, 428, 430, 431, 432, 433, 442, 480, 481, 450 and 451	2.00
Wind Mill Force Pumps, 10 inch Stroke, Figs. 404, 405, 406, 407, 410, 411, 413, 415, 416, 417, 418, 428, 432 and 433	2.50
Wind Mill Force Pumps, Adjustable Stroke, Figs. 405 and 410	2.50
Heavy Wind Mill Pumps, 6 inch Stroke, Figs. 426 and 427	2.50
Heavy Wind Mill Pumps, 10 inch Stroke, Figs. 426 and 427	3.00
Hand Force Pumps, Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 530, 531, 534 and 535	1.00
House Force Pumps, Single-acting, Figs. 520, 521, 522 and 524	1.50
House Force Pumps, Double-acting, Figs. 541 and 542	1.50
Movable Fulcrums, or Links, for Wind Mill Pumps, 6 inch stroke	.50
10 inch Stroke	.75

Pump Cylinders Only.

Cistern Pumps, Figs. 117, 118, 119, 120, 122 and 123.

Nos. 0 and 1	$ 1.25
No. 2	1.50
No. 3	1.75
No. 4	2.00
No. 5	2.25
No. 6	2.50

Pitcher Spout Pumps, Figs. 125, 126, 129 and 130.

No. 1	1.50
No. 2	1.75
No. 3	2.00
No. 4	2.25
No. 5	2.50

Hand Force Pumps, with Wind-mill Top, Figs. 430 and 431.

Nos. 2 and 3	$ 5.00
No. 4	7.00
No. 5	8.00

Double-acting Hand Force Pump, with Wind-mill Top, Figs. 480 and 481.

No. 2	7.00
No. 4	8.00

"Torrent" Double-acting Force Pumps, Figs. 486 and 487.

No. 2	10.00
No. 4	12.00
No. 6	15.00

Pump Cylinders Only—Continued.

Hand Force Pumps, Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510, 511 and 512.

No. 1	$ 3.00
Nos. 2 and 3	4.00
No. 4	6.00
No. 5	6.50

Hand Force Pumps, Figs. 530, 531, 534 and 535.

Nos. 0 and 1	3.00
Nos. 2, 3 and 4	4.00

House Force Pumps, Figs. 500, 501, 520, 521, 522, 524, 526, 545 and 546.

No. 1	3 50
No. 2	4.00
No. 3	4.25
No. 4	4 50
No. 5	5.00
No. 6	6.00

Double-acting House Force Pumps, Figs. 541, 542 and 543.

No. 1	4.00
No. 2	5.50
No. 3	6.50
No. 4	8.00
No. 5	11.00
No. 6	14.00

Hand and Power Piston Pumps, Figs. 585 and 590.

No. 4	4.00
No. 5	4.50

Brass Lift and Force Pumps, Figs. 556, 558 and 559, $5.00

Hand Boiler Feed Pump, Fig. 587 . . . . . 3.00

Brass Pump Cylinders double Iron list.

Iron Top Section of Brass Cylinder Force Pumps.

Hand Force Pumps, Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510 and 511.

No. 1	$ 2.00
Nos. 1 and 2	2.75
No. 4	4.00
No. 5	4.50

Hand Force Pumps, Figs. 530, 531, 534 and 535.

Nos. 0 and 1	2.00
Nos. 2, 3 and 4	2.75

Hand Force Pumps, Wind-mill Top, Figs. 430 and 431.

Nos. 2 and 3	2.75
No. 4	4.00
No. 5	4.50

House Force Pumps, Figs. 520, 521, 522, 524 and 526.

No. 1	2.00
Nos. 2 and 4	2.75
Nos. 5 and 6	4.00

Pump Plungers, with and without Rods.

Plungers, with Rods.

Cistern Pumps, Figs. 117, 118, 119, 120, 121 and 123.

No. 0	$ 0.70
No. 1	.75
No. 2	.80
No. 3	.90
No. 4	1 00
No. 5	1.15
No. 6	1.30

Cistern Pumps, Fig. 122 (all Brass Plunger, double list).

No. 1	1.25
Nos. 2 and 3	1.50
Nos. 4 and 5	1.75
No. 6	2.00

Molasses Pump, Fig. 140 (all Brass Plunger, double list).

No. 4	1.50
No. 5	1.75
No. 6	2 00
No. 7	2.50
No. 8	3.00

Pitcher Pumps, Figs. 125, 126 and 129.

No. 1	.75
No. 2	.80
No. 3	.90
No. 4	1.00
No. 5	1.25

Plungers, without Rods.

Hand Force Pumps (Cage, one half list), Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 530, 531, 534, 535, 430, 431, 480 and 481.

2, 2½ and 3 inch	$ 1.00
3½ and 4 inch	1.50

Iron House Force Pumps (Cage, one half list), Figs. 520, 521, 522, 524, 526, 541, 542, 543, 545 and 546.

3 inch and under	1.00
3½ and 4 inch	1.50
4½ inch	2.50

Brass House Force Pumps (Cage, one half list), Figs. 520, 521, 522, 524, 525, 516, 541, 542, 543, 545 and 546.

3 inch and under	2.25
3½ inch and over	2.75

Hand Boiler Feed Pumps (Cage, one half list), Fig. 587 . . . . . 1.00

Hand and Power Piston Pumps, Figs. 585 and 590.

3 inch	4.00
3½ inch	4.50

Pump Bases and Bottom Attachments.

Bases.

Cistern Pumps, Figs. 117, 118, 119, 120, 121, 122 and 123.

Nos. 0, 1 and 2	$0.75
No. 3	.85
No. 4	1.00
No. 5	1.15
No. 6	1.25

Pitcher Spout Pumps, Figs. 125, 126, 129 and 130.

No. 1	1.00
No. 2	1.10
No. 3	1.25
No. 4	1.50
No. 5	1.75

Molasses Pumps, Fig. 140.

Nos. 4 and 5	2.00
Nos. 6 and 7	2.25
No. 8	2.50

Well Pumps, Figs. 200, 201, 202, 203, 206 and 225.

Nos. 1 and 2	.75
No. 3	.85
Nos. 4, 5 and 6	1.00

Well Pumps, Figs. 205 and 207	1.00
Well Force Pumps, Figs. 220 and 221	1.25
Cistern and Well Force Pumps, Figs. 226 and 275.	1.25

Hand Force Pumps, Figs. 502, 504, 506, 508, 510 and 512.

Nos. 1 and 2	1.00
No. 3	1.25
Nos. 4 and 5	1.50

Hand Force Pumps, Fig. 530 and 534.

Nos. 0 and 1	1.00
Nos. 2, 3 and 4	1.25

Hand Force Pumps, with Wind-mill Top, Fig. 430.

No. 2	1.00
No. 3	1.25
Nos. 4 and 5	1.50

"Torrent" Double-acting Force Pumps, Figs. 480, 486 and 487.

No. 2	2.25
No. 4	3.00
No. 6	4.00

Bases—Continued.

Wind Mill Pumps, Fig. 407	$ 2.00
Figs. 410 and 415	2.50
Hand and Power Piston Pumps, Figs. 585 and 590,	2.50
Boiler Feed Pump, Fig. 592	6.00
Deep Well Pumps, Figs 584 and 586	6.00
Deep Well Working Heads, Figs. 432 and 433	3.00

Heavy Deep Well Working Head Fig. 435.

No. 1	5.00
No. 2	10.00

Bottom Flanges for Bracket Pumps.

Cistern and Force Pumps, Figs. 119, 431, 503, 505, 507, 509 and 511.

2, 2¼, 2½ and 2¾ inch	$ 0.50
3, 3¼, 3½ and 3¾ inch	.75
4 inch	1.00
4½ inch	1.25

Double-acting Force Pump, Fig. 481.

2½ inch	.75
3 inch	1.00

Double-acting Force Pumps, Figs. 541, 542 and 543.

2¼, 2½ and 3 inch	1.50
3½ inch	1.75
4 inch	2.25
4½ inch	2.75

Bottom Caps for Bracket Pumps.

Force Pumps, Single-acting, Figs. 500, 501, 531, 535, 520, 521, 522, 524, 526 and 587.

2 and 2¼ inch	$ 0.75
2½, 2¾ and 3 inch	1.00
3¼ and 3½ inch	1.25
3¾ inch	1.50
4 inch	1.75
4½ inch	2.00

Brass Flanges and Caps double the above lists.

Stocks or Standards Only.

Well Pumps, Figs. 200, 201, 202 and 203.

Nos. 1 and 2	$ 2.00
No. 3	2.40
No. 4	2.60
Nos. 5 and 6	2.75

Well Pumps, Figs. 208 and 209	4.50
Figs. 216 and 217	3.50
Figs. 210, 213 and 420	3.75
Figs. 211, 214 and 421	4.25
Figs. 212, 215 and 423	4.75

Well Pump Standards, Figs. 224 and 228.

No. 3	$ 3.75
No. 4	4.25
No. 5	4.75

Well Force Pumps, Figs. 220, 221 and Well Pump Fig. 225	4.50

Well Force Pumps, Figs. 226 and 275.

No. 4	4.00
No. 5	5.00

Stocks or Standards Only—Continued.

"Peerless" Double-acting Force Pumps, Figs. 250, 251, 450 and 451 . . . . . $ 5.00

Well Force Pump Standards, Figs. 219, 223, 229 and 239 . . . . . 4.50

Special Well Pump Standard, Fig. 227 . . . . . 5.00

Deep Well Pump Standards, Figs. 230 and 231.
Top Section 3.00
Bottom Section 4.00

Deep Well Pump Standards, Figs. 232, 233 and 234; also Figs. 426 and 427 (Wind-mill Top).
Top Section 4.00
Bottom Section 6.50

Wind Mill Pump Standard, Fig. 400.
No. 4 . . . . . 4.25
No. 5 and Fig. 402 . . . . . 5.50

Wind Mill Pump Standards, Figs. 403 and 419.
No. 3 . . . . . 3.75
No. 4 . . . . . 4.25
No. 5 . . . . . 4.75

Wind Mill Pump Standard, Fig. 401.
Top Section 2.40
Bottom Section 3.60

Wind Mill Force Pump Standards, Figs. 405 and 407 . . . . . $ 6.00

Wind Mill Force Pump Standard, Fig. 406.
Top Section 2.40
Bottom Section 3.60

Anti-freezing Wind Mill Three-way Pumps, Figs. 410, 415 and 416 . . . . . 3.00

Wind Mill Force Pump Standards, Figs. 404 and 411.
No. 4 . . . . . 6.50
No. 5 . . . . . 7.50

Wind Mill Force Pump Standards, Figs. 418, 428 6.50
Figs. 413, 417 and 422 . . . . . 6.00

Deep Well Force Pump Standard, with Fly-wheel, Fig. 584
Nos. 1 and 2 . . . . . 10.00

Geared Deep Well Pump Standard, with Fly-wheel, Fig. 586.
Nos. 1, 2 and 3 . . . . . 12.00

Standards Complete.

Well Pumps, Figs. 200 and 201.
Nos. 1 and 2 . . . . . $ 4.00
No. 3 . . . . . 4.50
No. 4 . . . . . 5.00
No. 5 . . . . . 5.50

Tight Top Well Pumps, Figs. 202 and 203.
Nos. 1 and 2 . . . . . 4.75
No. 3 . . . . . 5.25
No. 4 . . . . . 5.75
No. 5 . . . . . 6.25

Well Pump, Fig. 208 . . . . . 6.50

Tight Top Well Pump, Fig. 209 . . . . . 7.25

Well Pumps, Fig. 210 . . . . . 5.50
Fig. 211 . . . . . 6.00
Fig. 212 . . . . . 6.50

Tight Top Well Pumps, Fig. 213 . . . . . $ 6.25
Fig. 214 . . . . . 6.75
Fig. 215 . . . . . 7.25

Well Pump, Fig. 216 . . . . . 5.00

Tight Top Well Pump, Fig. 217 . . . . . 5.75

Well Force Pumps, Figs. 220 and 223 . . . . . 10.00
Fig. 219 . . . . . 9.00
Fig. 221 . . . . . 11.00

Well Pumps, with Wind-mill Top, Fig. 420 . . . 7.00
Fig. 421 . . . . . 7.50
Fig. 423 . . . . . 8.00

Well Force Pumps, with Wind-mill Top.
Fig. 422 . . . . . 10.00
Fig. 442 . . . . . 12.50

Force Pump Air Chambers.

Hand and House Force Pumps, Figs. 501, 504, 505, 521 and 526.
For 2, 2¼, 2½, 2¾, 3, 3¼ and 3½ inch Pumps . . . . . $ 2.00
For 4 and 4½ inch Pumps 2.50

Hand and House Force Pumps, Figs. 430, 431, 506, 507, 508, 509, 510, 511, 512, 522, 524, 526, 534, 535, 545 and 546.
For 2, 2¼, 2½, 2¾, 3, 3¼, and 3½ inch Pumps 2.50
For 4 and 4½ inch Pumps 3 00

"Torrent" D. A. Force Pumps, Figs. 480 and 481 3.50
Figs. 486 and 487, Nos. 2 and 4 . . . . . 4.00
Figs. 486 and 487, No. 6 . . . . . 8.00

Wind Mill Working Heads, Fig. 432 and 433 . . $ 6.00

Double-acting Force Pumps, Figs. 542 and 543.
For 2, 2¼, and 2½ inch Pumps 2.50
For 2¾ and 3 inch Pumps 3.50
For 3½ inch Pumps 5.00
For 4 inch Pumps 6.50
For 4½ inch Pumps 8.00

Well and Wind Mill Force Pumps, Figs. 221, 223, 226, 275, 405, 406 and 407 . . . . . 2.50
Fig. 231 . . . . . 3.00
Figs. 233, 427 and 585 . . . . . 4.00

Deep Well Working Head, Fig. 435.
No. 1 . . . . . 8.00
No. 2 . . . . . 15.00

Independent Cylinders or Working Barrels.

Diameter, Inches.	1¾	2	2¼	2½	2¾	3	3¼	3½	4	4½	5	6
Shell or Body.												
Figs. 300 and 301	$	$1.50	$1.50	$1.60	$1.80	$2.00	$2.25	$2.50	$3.25	$	$	$
Figs. 302 and 303, 12 inches long		2.30	2.30	2.45	2.55	2.70	3.00	3.25	3.80			
Figs. 302 and 303, 14 inches long		2.50	2.50	2.70	2.90	3.00	3.25	3.65	4.00	5.00	6.00	
Figs. 304, 305 and 316	2.80	2.80	2.80	3.05	3.30	3.55	3.80	4.00	4.30	5.75	8.00	11.00
Fig. 308, with Brass Lining		3.75	3.75	4.00	4.25	4.50	4.75	5.00	6.00			
Fig. 309, " " " 12 inches long		4.00	4.25	4.75	5.00	5.25	5.50	5.75	6.25			
Fig. 309, " " " 14 inches long		4.50	4.75	5.25	5.50	5.75	6.00	6.25	6.75			
Fig. 310, " " "		5.00	5 25	5.50	5.75	6.00	6.25	6.50	7.00			
Figs. 312 and 322, 10 inches long		3.75	3.75	4.00	4.25	4.50	4.75	5.50	7.00			
Figs. 312 and 322, 12 inches long		4.00	4.25	4.50	4.75	5.00	5.25	5.75	7.50			
Figs. 312 and 322, 14 inches long		4.25	4.50	4.75	5.00	5.25	5 50	6.00	7.75	9.50	11.00	12.50
Figs. 312 and 322, 16 inches long	4 50	4.50	4.75	5.25	5.50	5.75	6 00	6.75	8.50	10.50	12.50	14.00
Figs. 312 and 322, 18 inches long	4.75	4.75	5.25	5.50	5.75	6.00	6.75	8.50	10.50	12.50	14.00	16.00
Figs. 312 and 222, 20 inches long	5 00	5.25	5.50	5.75	6.00	6.75	8.50	10.00	12.00	14.00	16.50	
Bottom Attachments or Caps.												
Fitted Outside, Figs. 300, 301, 302, 304, 308, 309, 310, 312 and 318	.75	.75	.75	.75	.75	.75	.75	.90	.90	1.00	1.20	1.40
Fitted Inside, Figs. 303, 305 and 322 (with Valve)	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.25	1.25	1.50	1.50	1.50
Brass Bottom Attachments fitted outside	2.50	2.50	2.50	2.50	2.50	2.50	3.00	3.00	3.00	3.75	4.50	7.50
Brass Bottom Attachments fitted inside (with Valve)	2.00	2.00	2.00	2.25	2.25	2.25	2 75	2.75	2.75	3.50	4.25	7.00
Top Attachments or Caps.												
Fitted Outside, Figs. 300, 301, 302, 304, 308, 309, 310 and 312	.50	.50	.50	.50	.50	.50	.75	.75	.75	1.00	1.00	1.00
Fitted Inside, Figs. 303, 305 and 322	.75	.75	.75	.75	.75	.75	1.00	1.00	1.00	1.25	1.25	1.25
Brass Top Attachments fitted outside	1.25	1.25	1.25	1.50	1.50	1.50	2.00	2.00	2.00	2.50	3.00	5.00
Brass Top Attachments fitted inside	1.00	1.00	1.00	1.25	1.25	1.25	1.75	1.75	1.75	2 25	2.75	4.50
Plungers Only.—No Rods. (See Page 77.)												
"A" Style		.75	.75	.80	.90	1.00	1.15	1.30	1.50			
"B" Style		2.00	2.00	2.10	2.10	2.30	2.45	2.70	3.20	3.75	4.25	
"C" Style	2.30	2.30	2.30	2.45	2.70	2.95	3.20	3.45	3.95	4.50	5.25	6.50
"G" Style		.75	.75	.80	.90	1.00	1.15	1.30	1.50			
"H" Style Cage one-half Plunger list.		1.50	1.50	2.00	2.00	2.00	2.50	2.50	3.00			
All Brass Plungers.												
"F" Style, for 10 and 12 inch Cylinders		1.90	1.90	2.00	2.15	2.25	2.40	2.60	3.10	3.60	4.15	5.25
"B" Style, for 12 inch Cylinders		2.90	2.90	3.00	3.15	3.60	3.90	4.85	6.10	7.35	8.30	10.80
"B" Style, for 14 inch Cylinders		3.25	3.25	3.35	3 60	3.90	4.20	5.20	6.45	7.70	8.65	11.50
"C" Style, for 16 inch Cylinders Cage one-half Plunger list.	3.80	3.80	3.80	3.95	4.20	4.45	5.20	5.95	6.95	8.25	9.60	12.30
Plunger Poppet Valves, Iron	.10	.12	.14	.16	.20	.25	.30	.35	.45	.60	.75	1.00
Plunger Poppet Valves, Brass	.15	.17	.19	.21	.25	.30	.40	.45	.60	.75	1.00	1.50
Cylinder Ring Packing	.07	.07	.09	.09	.09	.10	.10	.11	.12	.13	.15	.18
Plunger Leathers, not Crimped	.10	.10	.11	.11	.12	.13	.13	.14	.15	.17	.20	.25
Plunger Leathers, Crimped	.25	.25	.26	.26	.27	.28	.28	.29	.35	.40	.45	.50
Lower Valve Leathers	.15	.15	.16	.16	.17	.17	.18	.20	.22	.25	.30	.35
Valve Weights and Screws	.15	.15	.15	.15	.15	.15	.15	.15	.20	.20	.25	.25
Lower Valves Complete	.25	.25	.26	.26	.27	.28	.28	.29	.35	.40	.45	.50

Miscellaneous Pump Repairs.

Stuffing-Box Caps and Glands.

	Cap.	Gland.
Deep Well Pump, Fig. 230	$0.50	. .
Deep Well Force Pump, Fig. 231	.75	$0.50
Heavy Deep Well Pumps, Figs. 232 and 426.	.90	. .
Heavy Deep Well Pumps, Figs. 233 and 427.	.90	.60
Well Force Pumps, Figs. 219, 220, 221, 223, 226, 250, 251, 450 and 451	1.00	.75
Hand Force Pumps, Figs. 430, 431, 480, and 481, 2 inch	.50	.75
2½ and 3 inch	.50	1 00
3½ and 4 inch	.65	1.00
Deep Well Standards with Fly-wheel, Figs. 584 and 586		1.00
Stuffing box Heads, Figs. 446, 447 and 448.		1.00
Stuffing-box Head, Fig. 449.		1.50
"Texas" Deep Well Working Head, Fig. 436		1.50
Hand Boiler Feed Pump, Fig. 587	50	1.00
House Force Pumps, Iron	.65	1.00
House Force Pumps, Brass	2.25	1.00
Wind Mill Force Pumps		.85
"Torrent" Double-acting Force Pumps, Figs. 486 and 487		1.50

Brass Stuffing-Box Bowls.

Hand and House Force Pumps, Single and Double-acting, Figs. 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 520, 521, 522, 524, 526, 530, 531, 534, 535, 541, 543, 545 and 546, all sizes	$1.25

Brass Valve Seats.

Cistern Pumps, Figs. 119, 123 and 124.	
Nos. 0, 1, 2, 3 and 4	$0.75
No. 5	1.00
No. 6	1.25
Hand and House Force Pumps.	
No 1	1.00
No. 2	1.00
No 3	1.25
No 4.	1.25
No. 5	1.50
No. 6	2.00
Wind Mill Force Pump, Fig. 431.	
2½ inch.	1.00
2½ to 3½ inch.	1.25
4 inch.	1.50

Braces.

Set-length and Wind Mill Pumps and Shallow Well Pump Standards	$0.50
"Peerless" D. A. Well Force Pumps. Figs. 250, 251, 450 and 451	.60
Deep Well Pump Standards. Figs. 227, 230 and 231	.60
Heavy Deep Well Pump Standards. Figs. 232, 233, 426 and 427	.75

Spouts.

Well and Wind Mill Pumps. Figs. 220, 227, 404, 413, 418, 510 and 511.	$0.50
Deep Well Pumps. Figs. 230, 232, and 426.	.75
Figs. 584 and 586.	1.50

Cast-Iron Set-Lengths.

Well Pumps. Figs. 201, 203 and 222	$2.25

Brass Tubes, for Iron or Lead Pipe.

For Cistern and Pitcher Pumps and Force Pumps.	
1 and 1¼ inch Pipe	$0.50
1½ inch Pipe	.75
2 inch Pipe	1.00

Spout and Air Chamber Nuts.

For Well, Hand and House Force and Wind Mill Pumps.	
1 and 1¼ inch.	$0.25
1½ inch	.35
2 inch and upward	.50

Iron Pipe Nuts.

For Cistern and Pitcher Pumps.	
1 and 1¼ inch	$0.35
1½ inch	.45
2 inch and upward	.60

Cross Heads and Links.

Well Pumps with Tight Top, Well Force Pumps, Hand Force Pumps, etc., including Figs. 202, 203, 206, 209, 213, 214, 215, 217, 219, 220, 221, 222, 223, 226, 228, 229, 239, 250, 251, 502 to 512, 530, 531, 534, 535 and 587.	
Cross Head.	$0.50
Links	.25
Heavy Deep Well Pump Standards, Figs. 232, 233 and 234.	
Cross Head.	.75
Links	.50
Deep Well Pump Standards, Figs. 230 and 231.	
Yoke	.80
Links	.20

Discharge Funnels. For Force Pumps without Air Chamber.

Single-acting Force Pumps. Figs. 500, 502, 503, 520, 530 and 531.	$1.00
Double-acting Force Pumps, Fig. 541.	
Nos. 1, 2, 3 and 4	1.50
Nos. 5 and 6	3.00

Miscellaneous Pump Repairs—Continued.

Bolts and Screws.

Cap Screws and Set Screws	$0.08
Lever and Bearer Bolts	.08

Guides for Piston Rods.

Single and Double-acting House Force Pumps, Figs. 520, 521, 522, 524, 526, 541, 542, 543, 545 and 546	$1.00
Southern Well Pump, Fig. 275	2.50
"Texas" Deep Well Working Head, Fig. 436.	
Double Rod Guide (Rods each)	1.50
Movable Piston Guide	3.00
Deep Well Standards, with Fly-wheel.	
Figs. 584 and 586	2.00
Mine and Deep Well Working Head, Fig. 435.	
No. 1, 10 and 16 inch Stroke	6.00
No. 2, 24 and 30 inch Stroke	10.00

Piston and Connecting Rods.

Well and Wind Mill Pumps.	
Round Polished Iron Rods	$0.60
Brass Cased Rods	1.00
Hand and House Force Pumps.	
Round Polished Iron Rods	.60
Brass Cased Rods	1.50
Stuffing-box Heads, Figs. 446, 447, 448 and 449.	
Brass Cased Rods	1.00
Wind Mill Force Pumps, Figs. 404, 405, 406, 407, 411, 413, 422, 442, 430, 431, 432, 480, 481, 450 and 451.	
Short Flat Rods	.60
Wind Mill Lift Pumps, Figs. 397, 399, 400, 401, 402, 403, 419, 420, 421 and 423.	
Long Flat Rods	.75
Anti-freezing Wind Mill Force Pumps, Figs. 408, 409, 410, 415 and 416.	
Long Flat Rods	1.00
Syphon Force Pumps, Figs. 320 and 321.	
Round Polished Iron Rods	1.75
Brass Cased Rods	2.50
"Texas" Deep Well Working Head, Fig. 436.	
Polished Iron Rod	1.00
Deep Well Working Head, Fig. 433.	
Polished Iron Rod (with Cross Head)	3.00
Mine and Artesian Well Working Head, Fig. 435.	
Polished Iron Rod	2.00
Solid Bronze Rod, No. 1	5.00
Solid Bronze Rod, No. 2	10.00

Pitmans.

House Force Pumps, Single and Double-acting, Figs. 520, 521, 522, 524, 541, 542 and 545	$1.00
House Force Pumps, with Crank Shaft Box. Figs. 526, 543 and 546	2.00
Southern Well Force Pumps, with Shaft Box. Fig. 275	5.00
Deep Well Pump Standards, with Fly-wheel. Figs. 584 and 586	15.00
Mine and Deep Well Working Head, Fig. 435.	
No. 1, 10 and 16 inch Stroke	5.00
No. 2, 24 and 30 inch Stroke	8.00
Deep Well Working Head, Fig. 433.	
With 6 inch stroke	4.00
With 10 inch stroke	5.00
"Texas" Deep Well Working Head, Fig. 436	
Guide Head and Pitman	5.00

Wind Mill Pump Attachments.

Flat and Round Rod Couplings	$0 50
Slide for connecting to Wind Mill Wood Rod	.50
Turned Malleable Pins for Wind Mill Pumps	.15

Pipe Flanges.

Well and Wind Mill Pump Standards, Figs 230, 231, 232, 233, 401, 406, 407, 426 and 427,	$0.50
Deep Well Working Heads, Figs. 432 and 433.	
For Suction Pipe	1.50
For Discharge Pipe	1.00
Mine and Artesian Well Working Head, Fig. 435.	
For Suction Pipe	5.00
For Discharge Pipe	3.00

Lever or Handle Balls.

Weight, pounds,	2¾	4½	6	8	10	12½
Price, each	$0.30	.45	.60	.80	1.00	1.25

Greenhouse Pump, Fig. 660.

Air Chamber and Stuffing-box	$1.00
Foot Piece or Stirrup	.60
Piston and Rod	1.00
Brass Cylinder	2.50
Discharge Hose and Pipe, Complete	3.00
Suction Hose, Complete	2.50
Handle	.50
Brass Discharge Pipe, Complete	1.00

Anti-Freezing Three-Way Wind Mill Force Pumps.

Figs 410 and 415.

Standard Complete, with Flat Rod and Lever. 6 inch stroke	$8.00
10 inch Stroke	9.50
Adjustable Stroke	10.00
Bottom Section Complete, with Hydrant Top	10.00
Standard Only, without Top	3.00
Standard Top only (Rod Guide). 6 inch Stroke	2.00
10 inch Stroke	3.00
Standard Top Only (Rod Guide). Adjustable Stroke	3.50
Flat Rod	1.00
Lever, 6 inch Stroke	1.50
Lever, 10 inch Stroke	1.75
Lever or Bearer Link, 6 inch Stroke	.50
Lever or Bearer Link, 10 inch Stroke	.75
Brace	.50
Platform Base Only	2.50
Platform Guide Plate	.40
Hydrant Spout with Stuffing-box (no wheel or Screw)	$2.85
Hydrant Spout without Stuffing-box	2.00
Hydrant Stuffing-box, Gland	.85
Hydrant Hand Wheel	.40
Brass Valve Screw in Hydrant Top	1.50
Bottom Section Only (without Stuffing-box, Pipes, Union or Flange)	3.00
Pipe Sleeve (Valve Rod Guide)	1.00
Pipe Sleeve Lock Nut	.30
Stuffing-box Cap (Bottom Section)	1.00
Stuffing-box Gland	.85
Brass Cased Rod	1.00
Rubber Gaskets for Two-way Valve, each	.30
Disk for Two-way Valve	.50
Brass Elbow Only (Bottom Discharge)	1.00
Union Nut for Brass Elbow	.35
Pipe Flange	1.00

Bottom Section, complete with Stuffing-box Cap, Gland, Brass-cased Rod, Pipe Sleeve, Pipe Flange and Union Nut for Elbow 8.00

"Triumph" Horizontal Double-Acting Force Pumps.

Figs. 600, 601, 602, 603, 604, 605, 606 and 613.

	No. 1	No. 2	No. 3	No. 4	No. 5.
Cylinder, with Valve Seats and Bushings	$11.00	$11.00	$11.00	$17.00	$18.00
Base, with Valve Seats	4.00	4.00	4.00	7.50	9.00
Air Chamber	2.50	2.50	2.50	4.00	5.00
Piston-rod	1.50	1.50	1.50	2.00	3.50
Piston with Leathers	2.00	2.00	2.00	3.50	4.00
Front Cylinder Head	1.00	1.00	1.00	2.50	4.00
Back Cylinder Head	.90	.90	.90	2.00	3.75
Stuffing-box Cap (Brass)	.50	.50	.50	1.00	1.25
Stuffing-box Gland	.40	.40	.40	.75	.85
Valves (Brass)	.50	.50	.50	.80	1.00
Leather Valves, each	1.25	1.25	. .	. .	. .
Lever Socket	.75	.75	.75	1.25	1.25
Malleable Iron Lever and Wood Handle	1.50	1.50	1.50	2.00	2.00
Link	.25	.25	.25	.35	.35
Suction Hose, Half Coupling	.90	.90	1.10	1.75	2.50
Discharge Hose, Half Coupling	.75	.75	.90	1.10	1.75
Long Bolt for Link	.25	.25	.25	.30	.40
Lever Bolts, each	.15	.15	.15	.20	.20
Crimped Leather Packings, each	.30	.30	.40	.60	.70
Brass Bushings for Suction and Discharge	1.00	1.00	1.00	1.25	1.50
Iron Pipe Nuts	.50	.50	.50	.60	.75
Lead Pipe Elbows and Unions, each	1.25	1.50	1.50	. .	. .
Brass Thumb Screws, each	.25	.25	.25	.35	.35

Hand Rotary Force Pumps.

Figs. 573, 574, 575, 576, 578 and 579.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Case, Cover, Stuffing-boxes and Caps	$8.00	$9.00	$10.00	$15.00	$17.00	$20.00
Cams, each	3.50	4.00	4.50	6.00	6.50	8.00
Base and Leather Valve	3.00	3.00	3.50	6.00	7.50	9.00
Spout and Cap	1.00	1.00	1.50	2.00	2.50	3.00
Balance Wheel (Light)	1.00	1.00	1.00	...	...	...
Balance Wheel (Heavy)	2.00	2.00	2.00	3.00	3.00	4.00
Stuffing-boxes and Tight Caps	.35	.35	.35	.35	.35	.50
Base for Fig. 578	3.00	3.00	3.50	4.00	5.50	5.50

Power Rotary Force Pump, on Frame.

Fig. 577.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Case, Cover, Stuffing-boxes and Caps	$8.00	$9.00	$10.00	$15.00	$17.00	$20.00
Cam with Short Shaft	3.50	4.00	4.50	6.00	6.50	8.00
Cam with Long Shaft	5.00	5.50	6.00	7.50	8.00	10.00
Small Base	1.50	1.75	1.75	...	...	...
Bed Plate	4.00	4.50	5.00	7.00	8.00	10.00
Valve Seat	...	...	...	1.50	1.50	2.00
Spout and Cap	1.00	1.00	1.50	2.00	2.50	3.00
Pulleys, each	2.00	2.50	3.00	4.00	4.00	5.00
Outside Bearing	1.00	1.25	1.25	2.00	5.00	6.00

"Syphon" Force Pumps.

Figs. 320 and 321.

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Air Chamber	$6.00	$6.00	$9.00	$9.00	$10.00	$12.00
Air Chamber Gland	1.00	1.00	1.25	1.25	1.50	2.00
Air Chamber Tube	.50	.50	1.00	1.00	1.50	2.00
Check Valve Case only	1.00	1.00	1.25	1.25	1.50	2.00
Check Valve Tube	1.00	1.25	1.50	2.00	2.50	3.00
Check Valve Nut	.50	.50	.75	.75	1.00	1.50
Suction Pipe Flange	.75	1.00	1.25	1.25	1.50	1.75
Outside Cylinder	4.00	4.00	5.50	5.50	7.00	7.00
Base Plate	2.00	2.00	2 50	2.50	3.00	4.00
Inside Cylinder, Brass-lined	3.00	3.50	4.00	5.00	6.00	7.00
Bottom Attachment for Inside Cylinder	.75	.85	1.00	1.25	1.50	1.75
Brass Plunger	2.50	3.00	3.50	4.00	4.50	5.00
Brass Valve Seat	.25	.30	.40	.50	.75	1.00
Piston-rod (only)	1.25	1.25	1.50	1.50	2.00	2.00

Improved Hydraulic Ram.

Fig. 690.

	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
Brass Impetus Valves and Case	$4 00	$5.00	$6.00	$10.00	$15.00	$20.00	$30.00
Brass Impetus Valve only	2.00	2.50	3.00	5.00	7.50	10.00	15.00
Air Chamber	3.00	3.75	4.50	8.00	15.00	20.00	50.00
Base only	3.00	3.75	4.50	7.00	13.50	18.00	50.00
Inside Valves complete	.25	.25	.38	.45	.65	1.25	3 50
Drive Pipe Couplings, Nut and Tube	.50	.50	.75	1.00	1.75	2.50	3.50
Discharge Pipe Couplings, " "	.40	.40	.60	.80	1.00	1.50	2 50
Set of Bolts and Nuts complete	.85	.90	.95	1.00	1.50	3.75	7.00
Packings for Air Chamber	.20	.25	.30	.35	.50	.90	2.50
Packings for Impetus Valve	.15	.18	.20	.25	.40	.60	1.00
Set of Packings complete	.50	.55	.65	.75	1.15	1.75	4.00
Brass Screws for Valve Case, each	.25	.25	.30	.30	.35	...	...

Repairs for Butchers' Tools.

Duplex Power Meat Chopper. Fig. 754.

	No. 16.	No. 17.		No. 16.	No. 17.
Center Sash, with Bearings and Caps	$20.00	$25.00	Cog Ring, under Block	$5.00	$6.00
Bottom Sash, with Roller Bearings	12.00	15.00	Rollers, " " each	1.00	1.00
Side Frames or Legs, either side	12.00	12.00	Hopper	6.00	7.00
Crank Shaft, Wrought-iron	23.00	25.00	Hood or Shield for Hopper	2.00	2.50
Upright Shafts, Right or Left, each	15.00	15.00	Yokes for guiding Pitman, each	1.00	1.00
Pitmans, with Caps, Right or Left, each	10.00	10.00	Jam Nuts, for Knife Arches, each	.50	.50
Turned Pitman Pins, each	1.00	1.00	Keys, " " " "	.75	.75
Shaft Caps, for Upright Bearings, each	.75	.75	Glass Oil Cups, each	.90	.90
Knife Arches, each	4.00	4.00	Feed Wheel, for Turning Block	1.50	1.50
Knives, each	8.00	9.00	Fly-wheel	8.00	8.00
Block only	15.00	18.00	Pulleys, 15 x 4, Tight or Loose	5.00	5.00

Silver's Improved Meat Chopper. Fig. 751.

	No. 2.	No. 3.	No. 4.	No. 5.
Knife Arch	$2.75	$2.75	$3.00	$3.00
Stop or Feed Wheel	2.00	2.00	2.00	2.00
Driving Gear	3.00	3.00	3.50	3.50
Pinion	1.50	1.50	1.50	1.50
Pitman	2.00	2.00	3.00	3.00
Cross Head	1.50	1.50	2.00	2.00
Anti-friction Rollers, with Stud, each	1.25	1.25	1.25	1.25
Anti-friction Roller Holders	1.00	1.00	1.00	1.00
Cog Ring, under Block	2.50	2.50	3.00	3.00
Fly-wheel	4.00	4.00	5.00	5.00
Crank Shaft	5.00	5.00	6.00	6.00
Hopper	3.00	3.50	4.00	4.50
Block	6.00	7.00	8.00	9.00
Knives, per pair	4.00	4.50	5.00	5.50
Handles, each	.75	.75	.75	.75
Center Tubes	.75	.75	.75	.75
Center or Main Casting	10.00	10.00	12.00	12.00
Legs, each	5.00	5.00	6.00	6.00
Shaft Handle	2.00	2.00	2.50	2.50
Stud for Stop Wheel	1.00	1.00	1.00	1.00
Pulley	. .	. .	2.00	2.00

Silver's Sausage Stuffers. Figs. 757 and 758.

	No. 1.	No. 2.	No. 3.	No. 4.		No. 1.	No. 2.	No. 3.	No. 4.
Frame	$2.00	$2.50	$3.00	$5.00	Tubes, each	$0.15	$0.15		
Cap			1.00	1.00	Plunger Heads	1.50	2.00	$3.00	$4.00
Barrel, complete	2.50	3.00	4.00	5.50	Crank Shaft			.75	.75
Ring on Barrel	.40	.50	.60	.60	Pinion Shaft	.50	.50	2.00	2.00
Cap on Barrel	.50	.60	.75	.75	Large Cog Wheel			1.00	1.00
Adjustable Mouth Piece			.50	.50	Handle	.50	.50	.60	.60
Tubes, per set			.60	.60					

"Pioneer" Sausage Stuffers. Figs. 755 and 756.

	No. 5.	No. 6.	No. 7.	No. 8.		No. 5.	No. 6.	No. 7.	No. 8.
Frame	$2.50	$3.00	$5.00	$9.00	Plunger Head	$2.50	$3.00	$4.00	$7.00
Cap	1.00	1.00	1.00	2.00	Large Gear Wheel, with Shaft and Pinion	2.50	3.00	3.00	4.50
Barrel, complete	4.00	5.00	6.50	10.00	Worm and Worm Shaft	1.00	1.00	1.00	1.50
Ring on Barrel	.60	.60	.60	.75	Handles, each	.60	.60	.60	.75
Cap on Barrel	.75	.75	.75	1.00	Weight and Latch, com.	1.25	1.25	1.25	2.00
Adjustable Mouth Piece	.50	.50	.50	.75	Center Ring for Barrel				1.50
Tubes, per set	.60	.60	.60	.75					

REPAIRS OR EXTRAS
FOR
Carriage Makers' Tools, Etc.

Silver's H. B. Machine, and Silver's Double Chuck Taper H. B. Machine. Figs. 710 and 714.

	Silver's H. B. Mach. Fig. 710.		Silver's Taper H. B. Mach. Fig. 714.
	No. 1.	No. 2.	
Barrel or Upright	$3.00	$4.00	
Center or Slide Arms	5.50	6.50	$4.50
Scroll Plates			4.50
Mandrel	3.00	5.50	6.00
Jaws, per set	5.00	6.00	3.50
Open Feed Nut	5.00	6.00	5.50
Jaws for Open Feed Nut, per set	1.50	2.50	1.50
Center for Open Feed Nut	1.50	2.00	1.50
Cap for Open Feed Nut	1.50	1.75	1.50
Gauge Plate	.60	.60	.60
Handle with Plate and Screw	.75	.75	.75
Pinion Shafts, each	1.25	1.75	
Intermediate Cog Wheel	1.00	1.00	
Revolving Disc and Slides			2.00
Rule to Adjust Bits			1.00
Bits, per set	.75	1.00	.75
Gib for Jaw	.25	.25	
Gib for Gauge Plate	.15	.15	.15
Malleable Wrench	.25	.25	.25

Dole's Hub-Boxing Machines. Figs. 711 and 712.

	No. 1.	No. 2.	No. 3.
Scroll Plate	$3.50	$3.50	$4.50
Center (Upright Stem and Slide)	3 75	3.75	4.50
Jaws, per set	2.75	2.75	3.50
Mandrel	3.00	3.00	4.50
Handle, with Plate and Screw	.75	.75	.75
Common Feed Nut	1.25	1.25	1.25
Open Feed Nut	5.00	5.00	6.00
Cap for Open Feed Nut	1.50	1.50	1.75
Jaws for Open Feed Nut, per set	1.50	1.50	2.50
Center for Open Feed Nut	1.50	1.50	2.00
Gauge Plate	.60	.60	.60
Bits, per set	.60	.75	.85
T Wrench	.50	.50	.50

Spoke Tenoning Machines. Figs. 716, 717 and 718.

	No. 1.	Nos. 2-2½.	Nos. 3-3½.
Head or Main Casting	$3.50	$4.00	$5.50
Stand for Main Casting	1.50	2.00	2.00
Pinion Shaft	.75	1.00	1.00
Pinion for same	.25	.40	.40
Mandrel	1.75	2.00	2.50
Pulley			2.00
Crank, with Handle	.75	1.00	1.00
Felloe Boring Attachment	5.00	7.00	7.00
Self-centering Chuck	8 00	8.00	8.00
Center for Self-centering Chuck	2.50	2.50	2.50
Scroll Plate for same	2.50	2.50	2.50
Jaws for same, per set	2.50	2.50	2.50
Feed Lever	.50	.75	.75
Feed Rack	.75	1.00	1.00
Spoke Rest	1.00	1.50	1.50
Guide for same	.75	1.00	1.00
Rest for same	.75	1.00	1.00
Reducers for attaching small Auger to large Machine		2.00	2.00
Frame (wood work)	1.50	2.00	2.00

Carriage Makers' and Blacksmiths' Tools—Continued.

Felloe Boring Attachments.

	No. 1.	Nos. 2–2½.	Nos. 3–3½
Block	$1.00	$1.50	$1.50
Block Bolt and Nut	.50	.50	.50
Washer	.10	.10	.10
Felloe Guides, per set	.25	.25	.25
Arch	1.00	1.50	1.50
Arch Screw	.75	1.00	1.00
Arch Bolts	.20	.30	.30
Arch Wrench	.10	.10	.10
Bit Chuck	2.00	2.50	2.50

For price list of Cook's Patent Machine Bits, see page 189.

"Star" Hollow Auger.

Fig. 715.

	No. 1.	No. 2.	No. 3.
Stock	$2.50	$7.50	$8.50
Ring	1.50	1.75	2.00
Face Plate	1.00	1.50	2.00
Screws, per set	.15	.15	.25
Brace Shank (not adjustable)	.50	.50	
Adjustable Brace Shank	1.50		
Bits, per set	1.00	1.50	1.50
Blanks, per set	.60	.80	.80
Files for sharpening Bits	.25	.25	.25
Oil Stones for finishing Bits	.15	.15	.15

Improved Blacksmith Drills.

Figs. 720 to 725.

	No. 1.	No. 2.	No. 3.	No. 4.
Frame	$10.00	$10.00	$15.00	$20.00
Fly-wheel	2.75	3.00	3.75	4.00
Internal Gear	2.00	2.25	3.00	3.50
Bevel Pinion	1.00	1.00	1.25	1.50
Feed Wheel	.75	.80	1.00	1.20
Feed Screw	1.00	1.15	1.25	1.40
Feed Nut	1.00	1.15	1.25	1.40
Spindle	2.00	2.25	2.75	3.25
Feed Arm	.75	.80	1.00	1.25
Friction Roller	.25	.30	.40	.50
Handle	.60	.75	.80	1.00
Sliding Table Rest	1.00	1.20	1.40	. .
Swinging Table Rest	. .	1.75	2.00	3.00
Sliding Table, Plate only	.50	.60	.75	. .
Swinging Table, Plate only	. .	.60	.75	1.00
Fly-wheel Shaft	1.00	1.25	1.40	1.75
Pinion on Fly-wheel Shaft	1.00	1.20	1.40	1.75
Coupling connecting Feed Screw and Spindle	.75	.85	1.00	1.00
Internal Gear Stud	1.00	1.20	1.40	2.00
Column for Sliding Table	. .	1.00	1.50	. .
Column for Swinging Table	. .	2.50	3.00	4.50
Plank	1.00	1.50	2.00	3.50

For price list of Twist Drills, see page 186.

Upright Bench Drill.

Fig. 726.

Frame	$6.00
Gear Wheel	1.50
Pinion	1.25
Handle	.60
Feed Wheel	75
Feed Screw	1.00
Spindle	2.00
Top or Feed Screw Nut	2.00
Coupling on Top of Spindle	.50
Table Rest	1.00
Table Plate	.60

Saw Gummer.

Fig. 776.

	No. 3.	No. 2.	No. 1.
Main Casting	$6.00	$9.50	$11.00
Lever	2.00	2.50	3.00
Cap	.80	1.00	1.50
Cap Bolts, per set	.60	.80	.85
Clip	. .	.50	.50
Die Bar	6.00	7.00	9.00
Punch or Upper Die	2.00	2.50	2.50
Lower Die	2.00	2.50	2.50
Special Dies, made to order, per set	5.00	6.50	7.00

REPAIRS OR EXTRAS

FOR THE

"Ohio" Standard Feed Cutters.

IMPROVED 1888.

Hand and Power Cutter, No. 9.

DESCRIPTION OF PART.	Casting No.	Price.	DESCRIPTION OF PART.	Casting No.	Price.
Front Plate	313	$0.55	Two Knife Head Right (give size of bore)	R 2 88	$1.50
Hood	314	1.50	Two " " Left " " " "	L 2 88	1.50
Top Plate	315	1.20	Four " " Right " " " "	R 4 88	2.00
Guard Plate, Front	316	.30	Four " " Left " " " "	L 4 88	2.00
Guard Plate, Back	317	.20	Lower Roller " " " "		1.60
Cutter Bar	318	1.25	Upper Roller " " " "		1.40
Side Plate, Right	304	2.50	Lower Roller Shaft (give size and length)		.85
Side Plate, Left	305	2.50	Upper Roller Shaft " " " "		.75
Journal Boxes, Right or Left	308	.65	Knife Shaft " " " "		3.40
Journal Caps, Right or Left	309	.55	Knives, Each		1.75
Spring Bar Arm, Right	350	.55	Crank Gear		1.25
Spring Bar Arm, Left	351	.55	Swing Gear		.65
Pinion Arm, Inside	360	.40	Double Gear on Lower Roller Shaft		1.00
Pinion Arm, Outside	361	.40	Pinion on Knife Shaft		.40
Links for same Inside or Outside	358	.20	Pinion on Upper Roller Shaft		.40
Swing Link for Changing Cut	321	.65	Pinion on Lower Roller Shaft		.40
Feed Lever Complete		3.00	Intermediate Pinions, Upper or Lower		.40
Feed Lever Only	10	.80	Turned Pins for same, each		.20
Stationary Casting for same	11	.55	Turned Stud for Crank Gear		1.40
Ratchet or Stop Casting for same	9	.35	Turned Stud for Swing Gear		.40
Malleable Thumb Latch for same		.15	Common Fly-wheel		5.00
Gear Shield		.35	Safety Fly-wheel Complete		7.50
Crank and Handle	66	.60	Safety-Fly-wheel Less Hub and Ring		5.75
Brace Iron for Frame, Right or Left		.45	Hub for Safety Fly-wheel		1.50
Brace Iron for Spring Bar		.15	Ring for Safety Fly-wheel		.45
Corner Iron for Box		.15	Pulleys 6, 8, 10 and 12×4 inch face		2.50
Oil Cup Caps, Each		.05	Pulleys 6, 8, 10 and 12×6 inch face		4.00

Ohio Standard Feed Cutters, for Power.

DESCRIPTION OF PART.	No. 11.		No. 13.		No. 16.		No. 18.	
	Casting No.	Price.	Casting No.	Price.	Casting No.	Price.	Casting No.	Price.
Front Plate	301	$0.55	225	$0.90	214	$1.10	200	$1.20
Hood	302	1.65	226	2.30	215	2.75	201	3.25
Top Ptate	303	1.40	227	2.00	216	2.50	202	2.75
Guard Plate, Front	306	.35	228	.55	217	.60	207	.70
Guard Plate, Back	307	.25	229	.35	218	.40	208	.45
Cutter Bar	311	1.50	230	1.75	219	2.00	213	2.25
Side Plate, Right	304	2.50	233	3.50	233	3.50	233	3.50
Side Plate, Left	305	2.50	234	3.50	234	3.50	234	3.50
Journal Box, Right or Left	308	.95	205	.80	205	.80	205	.80

Ohio Standard Feed Cutters, for Power—Continued.

DESCRIPTION OF PART.	No. 11. Casting No.	No. 11. Price.	No. 13. Casting No.	No. 13. Price.	No. 16. Casting No.	No. 16. Price.	No. 18. Casting No.	No. 18. Price.
Journal Cap	309	$0.55	206	$0.65	206	$0.65	206	$0.65
Spring Bar Arm, Right	350	.55	244	.75	244	.75	244	.75
Spring Bar Arm, Left	351	.55	243	.75	243	.75	243	.75
Swing Arm	357	.85	241	1.25	241	1.25	241	1.25
Link for same, Inside or Outside	359	.20	245	.30	245	.30	245	.30
Feed Lever, complete, with Grip and Shield	355	2.50	246	3.00	246	3.00	246	3.00
Feed Lever, only	355	1.00	246	1.00	246	1.00	246	1.00
Stop Casting, for Feed Lever	356	.30	247	.30	247	.30	247	.30
Malleable Thumb Latch for same		.15		.15		.15		.15
Turned Steel Pin "		.30		.30		.30		.30
Turned Stud "		.40		.40		.40		.40
Coil Spring "		.15		.15		.15		.15
Reach Rod "		.15		.15		.15		.15
Shield Plate "		.30		.35		.35		.35
Brace Iron, for frame, R or L		.45		.45		.45		.45
Brace Iron, for Spring Bar		.15		.25		.25		.25
Corner Iron, for Box		.06		.06		.06		.06
Oil Cup Caps, each		.05		.05		.05		.05
Shute Pan				2.00		2.50		2.75
Two Knife Head, right, (give size of bore)	R 2 88	1.50		. .		. .		. .
" " " Left, " "	L 2 88	1.50		. .		. .		. .
Four " " Right, " "	R 4 88	2.00	R 4 88	2.50	R 4 88	2.50	R 4 88	2.50
" " " Left, " "	L 4 88	2.00	L 4 88	2.50	L 4 88	2.50	L 4 88	2.50
Lower Roller, " "		1.80		2.60		3.00		3.25
Upper Roller, " "		1.60		2.40		2.75		3.00
Lower Roller Shaft, (give size and length)		2.50		3.00		3.25		3.50
Upper Roller Shaft, " "		.80		.85		1.00		1.15
Knife Shaft " "		4.25		5.00		5.75		6.25
Knives, each		2.25		2.75		3.50		4.00
Main Gear		2.00		2.50		2.50		2.50
Pinion on Knife Shaft (give size of bore)		.45		.75		.75		.75
Single Change Cut Pinion for Lower Roller		.80		.80		.80		.80
Double " " "		.65		.75		.75		.75
Double Intermediate Pinion		.70		.80		.80		.80
Single " "		.45		.60		.60		.60
Single Pinion, for Upper Roller Shaft		.45		.55		.55		.55
Turned Pins for Intermediate Pinion, each		.25		.30		.30		.30
Knife Bolts, each		.07		.07		.07		.07
Machine Bolts and Set Screws		.05		.05		.05		.05
Shaft Crank and Handle		.65		. .		. .		. .
Handle for Fly-wheel		.25		.25		.25		.25
Safety Fly-wheel, complete		7.50		10.00		12.00		12.00
Safety " less Hub and Ring		5.75		7.50		9.50		9.50
Hub for Safety Fly-wheel		1.50		2.00		2.00		2.00
Ring " "		.45		.50		.50		.50
Pulleys, 6, 8, 10 and 12 x 4 inch face		2.50		. .		. .		. .
" 6, 8, 10 and 12 x 6 inch face		4.00		4.00		4.00		4.00
" 15 x 6 inch face		. .		4.50		4.50		4.50
" 18 x 6 inch face		. .		. .		. .		6.00

Complete Repair List for old style Standard and Pony Cutters, "Ohio" Hand Cutters, also Special Ensilage Cutters and Carriers, furnished on application.

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